BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

Vol. 33.] 1936. [No. 7.

KALA AZAR.

NÁJERA ANGULO (Luis). Las leishmaniosis visceral y cutánea y su importancia en España. [**Leishmaniasis in Spain.**]—*Rev. Méd. Barcelona.* 1935. Dec. Vol. 24. No. 144. pp. 509–528. With 3 figs. (maps). [110 refs.]

This paper is itself in the nature of a review discussing the incidence of leishmaniasis in Spain. Up to the end of 1934 a total of 892 cases of kala azar had been registered in the country together with 27 cases of oriental sore. These figures are compared with records from Portugal, Greece and Italy. The figures are not strictly comparable though they give some indication of the frequency of the disease in these countries. The distribution of the cases according to provinces, ages, sex and association with sandflies is fully discussed. *C. M. Wenyon.*

NEGRO VAZQUEZ (Emilio). Algunos datos más sobre la leishmaniosis cutánea en el Levante de España. [**Cutaneous Leishmaniasis in Levante, Spain.**]—*Medicina Países Cálidos.* Madrid. 1936. Feb. Vol. 9. No. 2. pp. 87–88.

The case of oriental sore here described, and others which have been noted previously, indicate that the disease is endemic on the Valencian coast of Spain. *C. M. W.*

HERRERO RUBIO (Pedro). Aportaciones al estudio del kala-azar infantil. [**On Infantile Kala Azar.**]—*Medicina Países Cálidos.* Madrid. 1935. July. Vol. 8. No. 7. pp. 338–344. With 5 figs.

In writing of infantile kala azar in the province of Alicante in Spain the author points out that spleen puncture may fail to reveal parasites and that the disease can be diagnosed from the clinical features and the characteristic blood picture. Such a diagnosis receives confirmation by the response to specific antimony treatment. *C. M. W.*

QUARTERLY BULLETIN OF THE HEALTH ORGANISATION, LEAGUE OF NATIONS. Geneva. 1935. Dec. Vol. 4. No. 4. pp. 787–808. [72 refs.] **On the Diagnosis, Treatment and Epidemiology of Visceral Leishmaniasis in the Mediterranean Basin. I. Serological Tests** [CHRISTOPHERS (Richard)]. **II. Treatment** [CARONIA; SERGENT (Edm.); PITTALUGA]. **III. Epidemiology** [SERGENT (Edm.) & ADLER (S.)].

These articles have been written and published mainly for the guidance of those who are not familiar with the subjects dealt with. They do not give any new information. *C. M. W.*

PANAYOTATOU (A.). Sur les "leishmanioses" en Méditerranée. [**Leishmaniases in the Mediterranean Countries.**]—*Rev. Méd. et Hyg. Trop.* 1935. Nov.–Dec. Vol. 27. No. 6. pp. 279–310. [30 refs.]

A general summary of knowledge, adding nothing new. *C. M. W.*

FOURRIER (J.), GENOVA (A.) & DUVERGER (M.). Un cas de leishmaniose viscérale de l'adulte observé dans la région de Bône. [**Kala Azar in an Adult in Bone (N. Algeria).**]—*Arch. Inst. Pasteur d'Algérie.* 1935. Dec. Vol. 13. No. 4. pp. 492–494. With 2 figs. on 1 plate.

A case of kala azar in a man of 24 years of age. The disease was contracted in North Africa. *C. M. W.*

PAPANTONAKIS (E.). Die Leishmaniosen in der Provinz Messinia (Peloponnes, Griechenland). [**Leishmaniasis in Messenia Province, Greece.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1936. Apr. Vol. 40. No. 4. pp. 141–146. With 3 figs. (1 map).

In the mountainous north-west part of the Grecian province of Messenia kala azar in young children and dogs has been endemic for many years. In the flatter south-eastern parts the disease does not occur. Sandflies of the *Phlebotomus major* group were taken in the districts where the human and canine disease occurred. *C. M. W.*

CHODUKIN (N. I.), PETROV (V. P.) & KEVORKOV (N. P.). [**Epidemiology of Kala Azar in Tashkent.**]—*Trans. Inst. Epidemiol. & Microbiol.* Tashkent. 1934. Vol. 1. pp. 75–145. [In Russian.]

In this paper the authors give an account of the observations conducted in the course of the preceding seven years on the epidemiology of kala azar in Tashkent (Russian Turkestan), which are summarized as follows :—

The distribution of kala azar is focal, the foci of human and canine leishmaniases (the causative organisms of which are considered to be identical) coinciding in most cases. While dogs constitute the main reservoir, carriers amongst other animals—though not proved—are not excluded. Kala azar has a tendency to spread slowly from the focal areas, frequently dying out and then again reviving in the course of several years.

The seasonal incidence of leishmaniasis in Middle Asia is the same as that in India. Though children provided the majority of cases, infection in adults is not rare. Transmission is effected by sandflies.

Destruction of infected dogs is recommended as the most essential prophylactic measure. *C. A. Hoare.*

CHAGAS (E.). Nota prévia. Primeira verificação em individuo vivo da leishmaniose visceral no Brasil. [**First Case of Kala Azar, diagnosed during Life, in Brazil.**]—*Brasil-Medico.* 1936. Mar. 14. Vol. 50. No. 11. pp. 221–222. With 1 fig.

It has already been noted by PENNA [this *Bulletin*, Vol. 32, p. 481] that during the course of examinations of liver specimens obtained *post-mortem* from cases which had died of possible yellow fever occasionally leishmania infections were detected, indicating the probable

occurrence of kala azar in S. America. The author of the paper now under review describes the first autochthonous case of this disease diagnosed during life. It was in a youth 16 years of age from Araca-jú in the State of Sergipe. The features of the case and the parasites obtained by spleen puncture were characteristic of kala azar. It is noted that in the locality *Phlebotomus longipalpis* occurs in abundance.

C. M. W.

Berrebi (Jacques). La culture des leishmanies. [**The Cultivation of Leishmania.**]—*Arch. Inst. Pasteur de Tunis.* 1936. Jan. Vol. 25. No. 1. pp. 89–141. With 2 charts. [85 refs.]

This is a long paper describing the results of the author's investigations on the culture of leishmania. He commenced with the classical N.N.N. medium as a standard and by introducing various modifications has attempted to discover the factors which influence the growth of the flagellates. It is noted that the optimum concentration of sodium chloride is 1·5 per cent., that the optimum pH is 6 to 6·5, that heating the medium for purposes of sterilization is unfavourable, that the agar base acts merely as a dialysing membrane which permits nutriment to pass into the liquid in a progressive manner, that rabbit's blood can be replaced by the blood of man, ox, sheep, guineapig or rat but not by that of the horse, dog or cold-blooded animals, that the addition of glucose, lactose and particularly maltose helps the growth, that manganese, even in infinitesimal amounts, hinders growth, that calcium favours it, while iron, zinc, magnesium and aluminium are inert, that glycerol added to the liquid of condensation will permit growth of flagellates while killing off contaminating bacteria, thus affording a means of purifying contaminated cultures, that haemoglobin is not necessary, for medium prepared as N.N.N. medium with haemoglobin-free serum will give a good culture when inoculated with flagellates, though subculture into the same medium fails. It has not been possible, however, to elaborate another and better medium based on the foregoing data, the classical N.N.N. medium remaining the medium of choice for the cultivation and maintenance in culture of various leishmania and trypanosomes.

C. M. W.

Bianchi (Luigi). Die Blutmilch als Nährboden für Leishmanien. [**Blood and Skimmed Milk Medium for Cultivation of Leishmania.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1936. Apr. Vol. 40. No. 4. pp. 146–150. With 3 figs.

The author has found that leishmania can be readily cultivated in a medium consisting of rabbit blood 1 part and skimmed goat's or cow's milk 8 parts.

C. M. W.

Saito (Yasuichi). **Investigations on the Biological Characters of *Leishmania donovani*.**—*Jl. Oriental Med.* 1936. Mar. Vol. 24. No. 3. [In Japanese pp. 689–713. With 11 coloured figs. on 1 plate. [45 refs.] English summary p. 43.]

The paper describes the results of microchemical and vital staining tests carried out on cultural forms of *Leishmania donovani*. Various granules were brought to light, including oxydase and peroxydase. The nucleus and blepharoplast were the sites of oxidation, while reduction occurred in the cytoplasm, which gave a pH reading of 6·4 to 6·8.

C. M. W.

DA FONSECA (Flavio). Occorrencia de formas anomalas na *Leishmania brasiliensis*. [**Anomalous Forms of** *Leishmania brasiliensis*.]—*Mem. Inst. Butantan.* 1935. Vol. 9. pp. 185–188. With 22 coloured figs. on 1 plate facing p. 192. English summary (9 lines).

The author has shown that *Leishmania braziliensis* exhibits the same degree of structural variation as does *Leishmania tropica* of oriental sore. The various types of parasite noted are illustrated in a coloured plate. *C. M. W.*

ACANFORA (Giuseppe). Osservazioni su alcuni casi di leishmaniosi. [**Some Cases of Leishmaniasis.**]—*Ann. di Med. Nav. e Colon.* 1935. Nov.–Dec. (Supp.) 41st Year. Vol. 2. No. 5–6. pp. 897–915. With 6 figs.

An account of 3 cases of kala azar and 2 of oriental sore which were observed at the clinic for tropical and sub-tropical diseases at Rome. One of the cases of oriental sore showed involvement of the nasal mucosa. *C. M. W.*

ALBANO (Vincenzo). Su di un caso di kala-azar guarito spontaneamente in un bambino. [**Spontaneous Cure of Kala Azar in a Child.**]—*Pediatria.* 1936. Mar. 1. Vol. 14. No. 3. pp. 265–267.

The case recorded is that of a child 14 months old in which a diagnosis of kala azar was made both clinically and by the discovery of leishmania in bone marrow obtained by bone puncture. Complete recovery took place without treatment. *C. M. W.*

CARTIA (Giovanni). Due nuovi casi di kala-azar mediterraneo dell' adulto. [**Two New Cases of Kala Azar in Adults in Italy.**]—*Riv. Sanitaria Siciliana.* 1936. Jan. 15. Vol. 24. No. 2. pp. 80–82, 85–88.

In describing two fresh cases of kala azar in adults in Italy the author gives a list of 59 previously recorded cases in individuals from 13 to 55 years of age. *C. M. W.*

FRANCO (Enrico Emilio). Considerazioni su di un caso di leishmaniosi viscerale autoctona delle Puglie in un medico di 65 anni. [**Kala Azar in a Medical Man of 65 Years in the Department of Puglie (Italy).**—*Arch. Ital. Sci. Med. Colon.* 1935. Nov. Vol. 16. No. 11. pp. 790–804. [47 refs.]

The case described was somewhat remarkable on account of the age of the patient who was a medical man from Massafra (Taranto). A complete cure followed a course of intravenous injections of neostibosan. *C. M. W.*

PIERI (Jean). Deux kala-azar de l'adulte à évolution chronique. [**Two Chronic Cases of Kala Azar.**]—*Marseille-Méd.* 1935. Oct. 15. Vol. 72. No. 29. pp. 453–463.

These cases have already been referred to in a previous note [this *Bulletin*, 1936, Vol. 33, p. 26]. *C. M. W.*

Benhamou (E.) & Fourès (R.). À propos d'un nouveau cas de kala-azar vérifié par les frottis dermiques. L'ascite leishmanienne. [**Another Case of Kala Azar confirmed by Skin Smears. Leishmania in Ascitic Fluid.**]—*Bull. Soc. Path. Exot.* 1935. Oct. 9. Vol. 28. No. 8. pp. 706–708.

A child 3½ years of age was found by spleen puncture to be suffering from kala azar and was treated with neostibosan. About a year later a relapse appeared to have occurred. This was confirmed by the discovery of leishmania in smears from the skin of the thigh. Leishmania were then found in smears of the skin taken from various parts of the body. Though treatment was followed by general improvement parasites were found in the skin on 15 occasions. Later an attempted spleen puncture yielded only ascitic fluid in which large numbers of leishmania were found. The fluid was re-examined at long intervals and always showed parasites in great abundance, an indication of the intensity of the infection in this case. *C. M. W.*

Lee (C. U.) & Chung (H. L.). **A Clinical Study of the Early Manifestations of Chinese Kala-Azar.**—*Chinese Med. Jl.* 1935. Dec. Vol. 49. No. 12. pp. 1281–1300. With 7 charts. [19 refs.]

As very little appears to have been written about the early symptoms of kala azar the authors have studied carefully from this point of view 51 proved cases of the disease which were seen within two months of the onset of symptoms. Apart from the fact that children are generally more susceptible than adults and that in them the disease has a severer course there is no evident predisposing factor. The onset is very insidious. It may simulate typhoid fever in this respect or be quite sudden. The early symptoms in order of frequency are fever, chills, dizziness, headache, anorexia, cough and sweating. The temperature curve may resemble that of malaria, typhoid fever, tuberculosis or undulant fever, or it may be quite irregular. Daily double rises of temperature occur frequently but are not invariable. Remissions of symptoms during which the blood, liver and spleen tend to return to normal are characteristic. Within the first few weeks the only detectable abnormality may be fever but a degree of leucopenia develops early, while a study of the plasma proteids may show an increase in the globulin and euglobulin fractions. Experience has shown that in the presence of an obscure fever accompanied by a progressing leucopenia the possibility of kala azar must be borne in mind. Repeated examinations may have to be made in such cases before leishmania can be discovered. Acute agranulocytosis may occur occasionally as a serious complication during the early course of kala azar. The early cases respond readily to treatment, many becoming completely normal at the end of the fourth or fifth week. *C. M. W.*

Giraud (P.), Ciaudo & Bernard (R.). Variations des protéines sériques au cours de la leishmaniose interne. [**Variations in Serum Proteins in the Course of Kala Azar.**]—*Bull. Soc. Path. Exot.* 1935. Dec. 11. Vol. 28. No. 10. pp. 922–929.

The authors have studied the blood serum of 12 human and 4 canine cases of kala azar from the point of view of the protein content at different stages of the disease. The conclusion reached is that during the height of the disease there is a general increase in the total proteids

but a very variable decrease in the albumin, so that the albumin globulin ratio is lowered and often inverted. These modifications are frequently absent or even reversed at the commencement of the illness, while they disappear during the progress of cure resulting from antimony treatment. Though an estimation of the protein content of serum may give a useful indication of cure it cannot be regarded as a procedure of diagnostic value. *C. M. W.*

Di Benedetto (Vincenzo). La reazione di Henry (melano- e ferro-flocculazione) nella diagnosi della malaria e del kala-azar. [**Henry's Reaction in the Diagnosis of Malaria and Kala Azar.**]—*Riv. Sanitaria Siciliana.* 1935. July 15 & Aug. 1. Vol. 23. Nos. 14 & 15. pp. 1083–6, 1089–92, 1095–8; 1158–64, 1167–70, 1173–5. French summary (8 lines).

In this paper the author discusses at some length the reaction of Henry as an aid to the diagnosis of malaria and kala azar. As regards the former disease the test has been made in 150 cases, the results obtained being mostly positive and confirmatory of the claims of the originator of the test. Carried out in 50 cases of kala azar the results have also been almost uniformly positive, while they have been negative in 97 per cent. of 100 controls. The conclusion reached is that the reaction is of definite value for the diagnosis of malaria and kala azar. The explanation of the reaction is to be found in the physico-chemical changes in the blood rather than in the presence of specific antibodies.

C. M. W.

Giraud (P.), Ciaudo & Bernard (R.). Valeur de la réaction au peptonate de fer pour le diagnostic de la leishmaniose interne. [**The Peptonate of Iron Reaction in Diagnosis of Kala Azar.**]—*Bull. Soc. Path. Exot.* 1935. Nov. 13. Vol. 28. No. 9. pp. 811–817.

The authors have compared the peptonate of iron reaction with those of ureastibamine and formol and have found that the peptonate of iron, when used in a 1/320 solution, gives results which are equal in diagnostic value to those obtained with the other two reagents. Certain irregularities, however, occur, so that to obtain the best results the three tests should be applied. From the results obtained it is possible to state whether kala azar is probably present or not. *C. M. W.*

Pitruzzella (Rosolino). Ricerche sulla sieroreazione di Auricchio e Chieffi nella leishmaniosi viscerale. [**Auricchio and Chieffi's Peptonate of Iron Reaction in Kala Azar.**]—*Pediatria.* 1936. Apr. 1. Vol. 44. No. 4. pp. 285–295.

The serum reaction referred to in the title is Auricchio and Chieffi's modification of the Henry malaria test, in which a solution (1/600) of peptonate of iron is allowed to run on to the surface of the serum to be tested. A positive result is shown by an opalescence developing into a definite flocculation. The author has carried out the test with the serum from 24 cases of infantile kala azar, 35 normal children and 46 suffering from other illnesses. Of the kala azar cases 15 gave a three plus positive reaction and these were cases which either had not commenced or were still undergoing treatment. One case gave a completely negative result, while in 8 the reaction was of a one or two plus intensity. The controls were uniformly negative. *C. M. W.*

CHORINE (V.) & PRUDHOMME (R. O.). Mécanisme de la réaction au peptonate de fer pour le kala-azar. [**Mode of Action of the Peptonate of Iron Reaction in Kala Azar.**]—*C. R. Soc. Biol.* 1936. Vol. 121. No. 9. pp. 831–833.

The authors discuss the Auricchio and Chieffi reaction and conclude that, as in the Henry reaction, it is due solely to the fact that the peptonate of iron increases the concentration of hydrogen ions in the mixture. Precisely the same results are obtained by the use of distilled water instead of peptonate of iron. *C. M. W.*

SARKISSIAN (A. B.). Zur früh-diagnose von Kala-azar nach dem Blutbild. —*Arb. d. Tropeninstituts d. Volksgsndht. Kommissariat d. SSR. Armenien.* 1935. Vol. 2. [In Russian pp. 343–344. German summary p. 371.]

MENON (T. Bhaskara), ANNAMALAI (D. R.) & KRISHNASWAMI (T. K.). **The Value of the Aldehyde and Stiburea Tests in the Diagnosis of Kala-Azar.**—*Jl. Trop. Med. & Hyg.* 1936. Apr. 15. Vol. 39. No. 8. pp. 92–95. [15 refs.]

It is concluded that the neostibamine test has the advantage over the aldehyde test in that it can be performed with the quantity of serum obtained from a finger prick and that it gives a positive reaction in a larger percentage of cases. On the other hand a number of positive reactions are given in cases other than kala azar. It is found that both tests are open to fallacies but that these can to some extent be overcome if both are performed together and it is remembered that weak reactions may be misleading. As regard the cases of kala azar tested it is stated that the diagnosis in most instances was a clinical one, as spleen puncture is not favoured by the Madras School of physicians. This being so it is open to question as to how accurate or otherwise are the figures brought forward for comparison. *C. M. W.*

BENHAMOU (Ed.) & GILLE (R.). La réaction de Chopra en dehors du kala-azar. [**Chopra's Reaction in Diseases other than Kala Azar.**] —*C. R. Soc. Biol.* 1935. Vol. 120. No. 40. pp. 1261–1262.

Contrary to the generally accepted view the authors have found that a positive ureastibamine reaction occurs quite commonly in malaria and some other diseases. It becomes positive when there is an increase in euglobulin, a diminution in the albumin and cholesterin and an increase in the flocculability. Quinine treatment of malarial cases causes a positive reaction to become negative. The reaction is in no way specific for kala azar. *C. M. W.*

VAN DEN BRANDEN (F.). Sur la réaction au formol-néostibosan et la réaction au sulfarsénol dans le diagnostic des infections leishmaniennes. [**The Formol-neostibosan and the Sulfarsenol Reactions in the Diagnosis of Leishmanial Infections.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Dec. 31. Vol. 15. No. 4. pp. 569–571.

In this note the author records his experience in applying the formol-neostibosan reaction of Nattan-Larrier and Grimard-Richard to the sera from 42 normal Europeans and 31 normal natives in the Belgian

Congo. The results were entirely negative except for a slight flocculation in four cases. Of three hamsters infected with leishmania only one gave a definitely positive result with the sulfarsenol test of Caminopetros. *C. M. W.*

ROUSLACROIX, CIAUDO & LUMBROSO. À propos des réactions sérologiques de la leishmaniose positives en dehors de celle-ci. [**Positive Serological Reactions in Conditions other than Kala Azar.**]—*Marseille-Méd.* 1936. Jan. 25. Vol. 73. No. 3. pp. 114–118.

A case of endocarditis due to a "strepto-enterococcus" and presenting features of Banti's disease, chronic malaria and kala azar, was positive according to the serological test employed for the diagnosis of kala azar. The case is brought forward as another instance of the lack of specificity of the serological reactions which indicate merely an involvement of the reticulo-endothelial system. *C. M. W.*

NATTAN-LARRIER (L.) & DUFOUR (J.). Localisation des Leishmanias dans les épithéliums des canaux biliaires normaux et cancéreux. [**Leishmania in Normal and Cancerous Cells of the Bile Ducts.**]—*C. R. Soc. Biol.* 1936. Vol. 121. No. 1. pp. 13–17. With 2 figs.

In hamsters infected with *Leishmania donovani* the parasites may occur in the epithelial cells lining the bile tubules. In an animal suffering from epithelioma the parasites were also seen in the epithelium lining the alveoli which had developed from the bile tubules. In the tumour itself cells which had become definitely cancerous were less liable to infection than other cells which retained their normal tropism for the parasite. Macrophages in the tumour, as in normal tissue, were infected. *C. M. W.*

MO TEN SEI. **Pathologic-Anatomical and Pathologic-Histological Studies of Kala-Azar.**—*Jl. Oriental Med.* 1936. Feb. Vol. 24. No. 2. [In Japanese pp. 243–269. With 10 figs. on 2 plates. [35 refs.] English summary pp. 15–16.]

The study of tissues from 5 fatal cases of kala azar in Manchoukuo has shown that the histological changes are similar to those described for this disease in other endemic foci. *C. M. W.*

CHODUKIN (N. I.), SOFIEV (M. S.) & KEVORKOV (N. P.). [**The Identification of Various Strains of Leishmania.**]—*Trans. Inst. Epidemiol. & Microbiol.* Tashkent. 1935. Vol. 2. pp. 65–111. [In Russian.]

Working with various strains of *Leishmania* [human and canine *L. donovani* and *L. tropica* of local (Middle Asia) origin; *L. infantum* (Tunis), *L. donovani* (India), *L. tropica* (Baghdad) and *L. brasiliensis*] the authors applied the following methods, with the object of testing their relative value for the differential diagnosis of these strains :—

(1) Fermentation of sugars in cultures; (2) agglutination; (3) Castellani's method of absorption of agglutinins; (4) Noguchi's method (lytic sera); (5) complement fixation; (6) cultivation on Nöller's solid medium (appearance of colonies).

None of these methods proved to be suitable for specific differentiation, all of them producing group-reactions, which include both the human and canine strains. The failure to differentiate the leishmanias by the adhesion reaction has been previously recorded by these authors.

C. A. Hoare.

Shevtchenko (F. I.) & Radzivilovsky (G. L.). [**Canine Leishmaniasis in the Tashkent Breeding Kennels.**]—*Trans. Inst. Epidemiol. & Microbiol.* Tashkent. 1934. Vol. 1. pp. 146–149. [In Russian.]

The authors give an account of the incidence of leishmaniasis among dogs in the Tashkent breeding kennels. Both the visceral and cutaneous forms occurred, while in a number of cases a transition from a localized to a generalized infection took place. These are cited in evidence of the identity of the parasites responsible for both conditions.

C. A. Hoare.

Sofiev (M. S.) & Shevtchenko (F. I.). [**On the Identity of the Causative Agents of Cutaneous and Visceral Canine Leishmaniases.**] —*Trans. Inst. Epidemiol. & Microbiol.* Tashkent. 1934. Vol. 1. pp. 150–153. [In Russian.]

An analysis of previous records of cutaneous leishmaniasis in dogs has led the authors to doubt its independent nature, and to regard this condition as a manifestation of generalized leishmaniasis.

Support was lent to this view by observations on a number of cases of canine leishmaniasis in Tashkent. In one of these a skin lesion containing the parasites was found. Eight months after successful treatment of the sore the dog developed all the symptoms of visceral leishmaniasis, also confirmed microscopically. In another case a dog suffering from typical visceral leishmaniasis developed cutaneous sores after treatment, and after these had also been cured a relapse of the generalized infection occurred. It is concluded that cutaneous leishmaniasis in dogs represents one of the manifestations of generalized leishmaniasis : that the disease, having started with a localized lesion may become generalized, and that, *vice versa*, recovery from a generalized infection may lead to the appearance of localized lesions.

It is assumed that both conditions are due to a variation in the virulence of the same causative organism.

C. A. Hoare.

Lestoquard (F.) & Donatien. Un cas autochtone de leishmaniose générale du chien à Toulouse. [**Autochthonous Leishmaniasis in a Dog in Toulouse.**]—*Bull. Soc. Path. Exot.* 1935. Dec. 11. Vol. 28. No. 10. pp. 921–922.

During a stay in Toulouse the authors took the opportunity of examining for leishmania dogs which were destroyed in the pound. Amongst 12 examined there no case of infection was found. Their attention, however, was called to an Irish terrier belonging to the municipal dog catcher. It was in good condition but had ulcers about the ears and front feet. Examination of scrapings from the ulcers as

also of smears of bone marrow obtained by tibial trephine revealed leishmania. The dog had spent the whole of its life in the town so that the case was evidently one of autochthonous infection. No other case of infection so far from the Mediterranean coast, where human and canine kala azar is common, has been noted. The case forms a connecting link between the Mediterranean endemic centre and those of the Iberian Peninsula. *C. M. W.*

MARCHESI (F.), CRAINZ (F.) & SCAPATICCI (R.). Ricerche sulle variazioni stagionali della leishmaniosi dei cani in Roma. [**Investigations on the Seasonal Variations of Canine Leishmaniasis in Rome.**]—*Arch. Ital. Sci. Med. Colon.* 1935. Nov. Vol. 16. No. 11. pp. 805–812.

This paper appears to be an Italian version of one already published in the *Journal of Tropical Medicine* in English (see this *Bulletin, ante*, p. 18). *C. M. W.*

LÉPINE (P.) & BILFINGER (F.). Recherche de la leishmaniose viscérale chez les chiens de fourrière d'Athènes. [**Leishmaniasis among Dogs in the Pound at Athens.**]—*Bull. Soc. Path. Exot.* 1936. Feb. 12. Vol. 29. No. 2. pp. 131–135.

The authors have examined for evidence of leishmania infection 498 stray dogs destroyed at the pound in Athens. Smears of the liver, spleen and bone marrow were searched for parasites in all cases, while in 222 cultures were attempted from the blood or spleen. The result was that 55 cases of canine kala azar were discovered. Parasites were found 50 times in the bone marrow taken from the sternal end of a rib, 42 times in the spleen and 21 times in the liver. Of the cultures 21 were positive and of these two were from cases which had not shown parasites in the smears. Various serological tests were carried out with the blood of the dogs. In the known cases of kala azar the reactions were positive, while positive results were obtained also in a number of cases in which leishmania had not been found. If these are to be regarded as cases of latent infection the percentage of infections would be raised from 11·2 to 15·8. It is doubtful, however, if such a conclusion is justifiable. *C. M. W.*

POURSINES (Y.), SOULIE (P.) & SCANDARANI (Toufic). Enquête sur la leishmaniose canine à Beyrouth. [**Canine Leishmaniasis in Beirût.**]—*Jl. Egyptian Med. Assoc.* 1935. Dec. Vol. 18. No. 12. pp. 773–782.

An examination of 46 dogs in Beirût has revealed a visceral leishmania infection in three. It is noteworthy that the three dogs were pedigree dogs, two of which had been imported from France, and that they came from the centre of the European quarter. Of the dogs found to have no infection 30 were stray dogs destroyed by the municipal authorities. *C. M. W.*

Giraud (Paul), Ciaudo (P.) & Bernard (R.). Sur la date d'apparition des réactions sérologiques dans la leishmaniose canine expérimentale. [**Time of Appearance of Serum Reactions in Experimental Canine Leishmaniasis.**]—*C. R. Soc. Biol.* 1935. Vol. 120. No. 40. pp. 1250–1252.

Observations on the changes in the serum of two dogs experimentally infected with kala azar indicated that these do not become evident till after the expiry of 3 to 6 months from the date of inoculation. The albumin-globulin ratio reveals at first an increase but this diminishes as the disease progresses. Similarly the formol, ureastibamine, sulfarsenol and peptonate of iron reactions became evident after a similar interval and gradually increased in intensity. The ureastibamine and the peptonate of iron reactions were equally reliable, while the formol reaction was slightly less so. The sulfarsenol reaction gave most variable and unreliable results. *C. M. W.*

Humphreys (R. M.) & Mayne (F. S.). **Oral Leishmaniasis in the Anglo-Egyptian Sudan.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1935. Nov. 25. Vol. 29. No. 3. pp. 285–288. With 3 figs. on 1 plate.

The paper describes 3 cases, one British and 2 native, of oral leishmaniasis. In one case there were lobulated growths on the hard palate, whole of the soft palate, the tonsils, inner side of gums of upper jaw, and mucosa of the nasopharynx and nares. The liver and spleen were enlarged. Leishmania were discovered in material obtained by puncturing the growths but not in that from the spleen. The British case commenced as purple patches on the gums. The condition developed steadily for 7 years till, when seen by one of the authors, the floor of the mouth, palate, gums and inner aspect of the cheeks had the appearance of granulation tissue with small ulcers. Smears from a freshly excised portion of the gums showed leishmania. In the third case there was a flat papillomatous growth on the floor of the mouth extending to the lower jaw and on to the buccal mucous membrane. The liver and spleen were both much enlarged. Spleen puncture failed to reveal leishmania which were present in the oral growth. The cases were treated with intravenous injections of tartar emetic or neostibosan. All three cases responded well to treatment, though it was necessary to give larger doses and to continue the treatment over a longer period than is necessary for kala azar. *C. M. W.*

Kousa. Contribution au traitement du bouton d'Alep. [**On the Treatment of Oriental Sore in Aleppo.**]—*Jl. Egyptian Med. Assoc.* 1935. Aug. Vol. 18. No. 8. pp. 564–569.

The paper reviews the work of the special clinic devoted to oriental sore in Aleppo. Numerous methods of treatment have been employed but at present three are chiefly used. These are the cryocautery, valuable because of the rapidity of its application ; dressing, after curetting, with a compress soaked in a 25 per cent. solution of iron perchloride ; and, finally, intravenous injections of fouadin, used when the sores are in such a position that they cannot be dealt with by the other methods. Though oriental sore is very common in Aleppo visceral leishmania does not appear to exist as numerous spleen punctures performed in different hospitals have failed to demonstrate the parasite. *C. M. W.*

SHATTUCK (George Cheever). **The Distribution of American Leishmaniasis in Relation to that of Phlebotomus.**—*Amer. Jl. Trop. Med.* 1936. Mar. Vol. 16. No. 2. pp. 187–205. [56 refs.]

This is a very interesting review of the records of American leishmaniasis in various localities, written with special reference to a possible correlation between the distribution of the disease and that of sandflies of the genus *Phlebotomus*. Though the records regarding the sandflies are far from complete it appears that a definite correlation actually exists and it seems probable that all forms of leishmaniasis are transmitted usually by species of *Phlebotomus*. It is possible, however, that the disease may occasionally be transmitted by other vectors and even by direct or indirect contact. It is clear that much more work has to be done on the method of transmission of leishmaniasis in America and the paper under review affords an excellent introduction to the subject.

C. M. W.

BLACKWATER FEVER.

Foy (Henry) & Kondi (Athena). **Researches on Blackwater Fever in Greece. I.—Introduction and History. II.—A Note on the Action of Ehrlich's Diazo-Reagent on the Unhaemolyzed Serum of the Rabbit. III.—A New Photo-Nephelometric Method for the Quantitative Estimation of Minute Amounts of Quinine in Faeces and Body Fluids.**—*Ann. Trop. Med. & Parasit.* 1935. Oct. 5 & Dec. 18. Vol. 29. Nos. 3 & 4. pp. 383–393. [37 refs.]; 395–397. [15 refs.]; 497–515. With 2 graphs & 2 diagrams. [29 refs.]

I. The researches which will form the basis of this series of papers are being undertaken under the aegis of the Health Organisation of the League of Nations.

The first paper deals with the history of blackwater fever in Greece. A certain amount of confusion exists as to the precise interpretation of the Hippocratic cases. Careful examination of the Hippocratic corpus in Greek, and of numerous translated texts has led the authors to the opinion that if the cases described by Hippocrates were not blackwater fever, then it is very hard to say what they were. It is believed that this is the first attempt to analyse critically the Hippocratic texts with regard to these blackwater fever cases.*

At the present time there appear to be four more or less ill-defined types of haemoglobinuria occurring in Greece, some of which can hardly be regarded as falling into the category of blackwater fever, as at present understood. One type is the so-called malaria haemoglobinuria (with or without quinine); another is produced by eating beans, *Fava vulgaris*; a third group consists of quinine-sensitive individuals; and lastly there is a certain number of cases of Weil's disease. Clinically, the first three are indistinguishable from one another, and the fourth can only be diagnosed by laboratory methods rarely resorted to in Greece.

Whether these various types of haemoglobinuria were existent when Hippocrates wrote in 450 B.C. is impossible to say, though it is highly improbable that the Greeks were familiar with quinine. The fact that the Greeks were unfamiliar with quinine is, however, hardly an argument against regarding the Hippocratic cases as blackwater.

The authors give a number of representative Hippocratic cases freely translated into English either from the Greek, the German, or the French, and checked against the already existing English texts. They remark that it will be seen that the various cases exhibited such characteristic symptoms of blackwater fever as black or red urine, icterus, enlarged spleen, vomiting, anuria, uraemia, and fever. They then pass to a consideration of subsequent references to the disease in Greek literature. From 450 B.C. until late Byzantine times no reference which could be regarded as relating to blackwater fever is traceable.

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*[The term "black urine" (μέλαινα οὖρα) used in the first book of Hippocrates' *Epidemics* is, of course, very indefinite, and the modern term αἱμοσφαιρινουρικὸς πυρετός or haemoglobinuric fever (αἱμοσφαίρινη = haemoglobin) was naturally not known before the microscope could differentiate haemoglobinuria from haematuria.

πυρετός might mean any form of fever, but from Aristophanes' time onwards it was applied to the prevalent fever, malaria, and was not used of certain other fevers, plague for example.—Ed.]

In the seventh century A.D., however, Theophilos Protospatharios mentions black urine ; and in the twelfth century A.D., Actuarios refers to black urine accompanied by fever and icterus. From this period until the middle of the nineteenth century no statements are traceable in Greek that may be regarded as referring to blackwater fever.

In 1842 Mavroyanis writes that " one form of malignant intermittent fever is that which affects the bowels, *viz.*, the bloody or black-bile fever," but whether this is meant to apply to haemoglobinuria seems doubtful.

The first undoubted reference to blackwater fever in Greece by a Greek author was in 1858, when Antoniades mentions that a number of Greek doctors have observed that haematuria (haemoglobinuria) is a common symptom of the intermittent fever and follows the administration of quinine.

II. Experiments were performed on the unhaemolysed serum of a rabbit, with the object of ascertaining the bilirubin level as a guide to the reticulo-endothelial blockade. The authors used the original van den Bergh reaction, and also that of Thannhauser and Andersen.

Contrary to the work of Lepehne (1919) it was found that the serum of normal rabbits contains no bilirubin that reacts with the diazo-reagent of Ehrlich, thus confirming Hida, Yamanaka and Maeda. How far this is due to smaller amounts present in the serum of rabbits, or to differences in the renal thresholds for this substance, or to factors connected with the reticulo-endothelial system, it is impossible to say.

III. These studies were undertaken in an attempt to throw some light on the action of quinine in blackwater fever after blockade of the reticulo-endothelium with thorotrast or electro-colloidal copper (Heyden) ; on the relation of this blockade to the effectiveness of quinine in clearing the blood of malaria parasites ; and on the question whether blockade has any effect upon the blood levels and upon the rate of excretion of quinine.

Before any of these problems could be attacked it was necessary to develop some practical means of estimating quinine in blood and urine and if possible in faeces. It also seemed desirable to use some method for ascertaining to what extent the blockade of the reticulo-endothelial system had become effective, as otherwise it would be impossible to draw conclusions. Work is progressing on the latter problem and will be recorded later ; the object of the present paper is to call attention to what the authors believe to be a new method for estimating minute amounts of quinine in 1 cc. of urine (which can also be made applicable to faeces), and to certain improvements which they have introduced into the methods for blood quinine.

Since Ramsden and Lipkin (1918) described their laborious methods for blood and urine quinine estimation, little or no real advance has been made in the study of blood quinine levels and their correlation with the excretion of the alkaloid by the renal and alimentary routes. Acton and King (1921) modified Ramsden and Lipkin's method and reduced the time and labour necessary to make the estimations, but still left much to be desired, both as to practicability and sensitivity. Roy (1926) increased the sensitiveness of the colorimetric methods by introducing a modified Wagner's reagent indicator for blood quinine ; and later Vedder and Masen (1931) still further improved the colorimetric method by introducing gum-ghatti and a potassium bismuth iodide indicator, claiming that the gum-ghatti stabilized the colour of

their indicator, and that with this indicator the large number of standards necessary for use with Roy's reagent were unnecessary. The authors, however, reached the conclusion that the instability of the colour in both these colorimetric methods renders them worthless. In view of this they decided to modify VEDDER and MASEN's (1931) nephelometric method for blood quinine.

The sensitivity and accuracy of the method developed by the authors for the estimation of quinine in urine is, as is shown from their results, all that can be desired. It is impossible in a summary of moderate length to describe the authors' method in an adequate manner and the paper must be consulted in the original by those interested.

The following summary is given by the authors :—

"1. A new photo-nephelometric method is described for the quantitative estimation of minute amounts of quinine in faeces and body fluids, which is accurate and sensitive to 0·5 mg. per litre.

"2. The use of a new photo-nephelometer, for use with a standardized turbidity prism, is briefly described.

"3. Variations in the amount of quinine excreted in the urine after similar doses are noted.

"4. Large quantities of quinine were found to be frequently excreted in the faeces.

"5. The discrepancy between the amount of quinine absorbed, as shown by the urine level and blood quinine level, is noted."

W. Yorke.

REYNTJENS. La fièvre bilieuse hémoglobinurique et l'enfance noire. [**Blackwater Fever and the Black Child.**]—*Bull. Méd. du Katanga.* 1935. Vol. 12. No. 4. pp. 141, 143–147.

Under normal conditions the black child, especially during its first year of life, escapes blackwater fever, although it frequently dies of malaria. When, however, it is protected against the effects of malaria by quininization it becomes susceptible to blackwater, This is illustrated by two cases which came under the author's observation.

The first case was that of a Baluba (Kasongo) child born on 25th August, 1934. It was a splendid specimen and doubled its weight in 3 months. It was taken twice weekly to the clinic and given 0·13 gm. of quinine at each visit. The child remained apparently quite well until 1st April, 1935, when 72 hours after the last dose of quinine, and after a cold and wet journey, it was brought to hospital in a comatose state ; the blood contained malaria parasites and the urine haemoglobin. Death supervened within 12 hours.

The second case was that of a Babemba (Fort Rosebery) child born on 4th August, 1934. It was healthy and doubled its weight in $2\frac{1}{2}$ months. It was given 0·13 gm. of quinine twice weekly, except during the 4th and 5th months. On 1st April, 1935, it developed haematuria [*sic*], although it had not taken quinine during the previous 6 days. On admission to hospital the blood contained many parasites and the temperature was 39·3°C. Atebrin and plasmoquine were given and the cure was rapid. On 3rd June there was a relapse, the blood containing numerous gametes. Quinine 0·25 gm. and plasmoquine were given, and 2 hours later haemoglobin appeared in the urine and death occurred 6 hours later.

The author draws attention to the fact that these two patients developed blackwater fever on the same day, *viz.*, 1st April, 1935, and that on the 3rd June when the second case relapsed a young man was

also admitted to hospital with the disease. He points out that these days were particularly cold, and that the 31st of March and 1st of April were also very wet. The two children were regularly quininized since birth, but notwithstanding their growth the dose remained constant at 0·13 gm. twice weekly. *W. Y.*

CHESTERMAN (Clement C.). **Blackwater Fever in a Negro Child.**—*Lancet.* 1935. Sept. 7. p. 554.

In a hyperendemic malarial region, such as the Central Congo Forest, native children either die of malaria or reach a condition of tolerance in which there is a relative freedom from febrile attacks, although parasites are still present in the blood, and an immunity from blackwater fever. Among natives who have acquired tolerance to malaria from childhood blackwater fever is practically unknown, but recently evidence has been obtained that under certain conditions this protection may break down. An illustration of this is given. The patient was a full-blooded negro child aged 2½ years. For the first 18 months of life he attended the infant welfare clinic at Yakusu Hospital and was given routine weekly doses of quinine HCl varying from 0·04 gm. to 0·1 gm. On 5th February, 1935, after two days fever, he was brought to hospital and given 0·08 gm. of quinine ; next day he had haemoglobinuria : the blood showed pigmented monocytes, but no parasites. The condition quickly resolved, but a week later scanty *P. falciparum* were found in the blood. Another dose of 0·08 gm. quinine was given without untoward result.

The mortality among the clinic babies is less than 150 per 1,000 and this is attributed to the regular weekly dose of quinine. During the last 10 years over 1,000 babies have attended the clinic and the case recorded is the only instance of haemoglobinuria observed.

Reference is made to the fact that LECLEF and DE DECKER [this *Bulletin*, 1932, Vol. 29, pp. 664–5] from the Katanga Copper Mines have reported 28 cases of blackwater with 3 deaths among natives who come from malaria regions. These cases were attributed to the unaccustomed dosing with quinine and to the predisposing causes of debility among bush natives working in industrial conditions. *W. Y.*

JACKSON (Stanley). **A Case of Blackwater Fever in an Infant, a Native of Nigeria.**—*Jl. Trop. Med. & Hyg.* 1935. Nov. 15. Vol. 38. No. 22. p. 284.

A fatal case of blackwater is described in a native infant at Hospital, Plateau Province, Northern Nigeria.

The child was 16 months old and had had 3 previous attacks of fever. On admission the temperature was 102°F., the liver and spleen were enlarged, the skin was icteric, and the blood contained numerous *P. falciparum*. Quinine was given and blackwater fever supervened from which the child died. *W. Y.*

GORDON (R. M.) & DAVEY (T. H.). **The Association of Bacteriuria with Blackwater Fever in West Africa.**—*Ann. Trop. Med. & Parasit.* 1935. Dec. 18. Vol. 29. No. 4. pp. 439–456. [13 refs.]

During recent years an extensive literature has accumulated regarding various possible factors in the aetiology of blackwater fever, but whereas publications on the biochemical changes in this disease

have steadily increased, references to bacteriological investigations have diminished. This is probably due to the fact that there appears to be a steadily increasing consensus of opinion that blackwater fever is not due to a specific organism in addition to the malaria parasite. In the comparatively few instances in which blood cultures have been carried out, the majority proved sterile. STEPHENS and CHRISTOPHERS (1900), however, recorded the presence of staphylococcus in heart and liver cultures made at an autopsy in a case of blackwater fever, and CRICHLOW (1929) referred to the occurrence of staphylococcus-like organisms in the blood. Practically no bacteriological data are available regarding the urine in blackwater fever.

The authors' attention was first drawn to the presence of bacteria in the urine of blackwater fever patients in 1924, when, for the purpose of making certain observations on haemolysis, they wished to carry out experiments with sterile blackwater urine. Specimens of urine were obtained aseptically from a case of blackwater fever, but on each occasion staphylococci were present. Under the impression that the organism was probably a contamination from the air or skin, a catheter specimen was taken with all possible precautions. This also yielded a pure culture of staphylococcus.

This paper records the results of the examination of as many active and recovered cases of blackwater fever as have been recently encountered. Specimens were taken with proper aseptic precautions from 7 cases during, or within a few days of, the haemolysis. Cultures were also made from the urines of 13 recovered patients, 12 of whom contracted their blackwater fever in West Africa, and most of whom gave a history of several years' freedom from the disease prior to the examination. For the purpose of control the urine of 20 Europeans, who had been in Sierra Leone for two years or more, were examined and also those of 24 West African natives; none of the controls was under treatment for any genito-urinary infection. No anaerobic cultures were carried out, although the authors are of opinion that this line of investigation might yield interesting results.

The method adopted for obtaining specimens of urine from the male as aseptically as possible was as follows:—

"The glans and meatus were carefully washed up with sterile soap and water, followed by a wash with absolute alcohol, and, having discarded the first flow of urine, specimens were collected directly into two or more broth tubes. We are of the opinion that this method is generally more satisfactory than the passing of a catheter, and it was usually adopted; but in the case of females, natives and some patients in the active stage of blackwater, it was found necessary to pass a catheter after the preliminary washing-up just described. At the beginning of this investigation, primary cultures were obtained by taking samples of about 5 c.cm. urine into 20 c.cm. liver broth; but later, nutrient broth was substituted, as it was found that the majority of the various organisms grew with equal regularity on this medium. The centrifuged deposit was never employed for cultural investigation. The broth and urine mixture was kept at 37°C. for four days, at the end of which time, if no growth was observed, sterility was confirmed by plating on nutrient agar. The usual bacteriological technique was followed for the isolation and identification of the organisms, and the results obtained are recorded in the Appendix."

The authors give the following summary and conclusion of their work:—

"In 7 cases of blackwater fever examined during the active stage of the disease all 7 were found to be excreting organisms in their urine. Amongst

so small a series of cases, such an association may, of course, be merely a coincidence ; we cannot, however, dismiss it as such, until a case of active blackwater fever is encountered in whose urine no organisms are to be found. We have not observed such a case in Sierra Leone, and the one case examined for us in England was also associated with a bacteriuria.

" In 13 recovered cases, examined at various periods from one month to ten years after the attack, 12 were found to have bacteria in their urine, while in one, examined two years after the attack, no bacteria were found on culture.

" Amongst 44 European and African controls, examined by the same technique, 34 were found to be similarly excreting organisms. The incidence of bacteriuria, therefore, amongst the active and recovered blackwater cases was higher than amongst the controls, 95 per cent. as compared with 77 per cent.

" In the small series of active and recovered blackwater cases in which quantitative estimations were made, the concentration of bacteria was generally found to be higher than amongst the control cases.

" A comparison of organisms of the same genera, *i.e.*, staphylococci or streptococci, isolated from active and recovered blackwater cases and from control cases, showed no essential differences in morphological, cultural or biochemical characters.

" We have been unable to produce any evidence that bacteria isolated from the urines of active and recovered blackwater cases, or from control cases, show any marked pathogenicity.

" Although it has thus been shown that blackwater fever is constantly associated with bacteriuria in the series of cases examined by us, and that the concentration of bacteria is usually high, yet, since we have been unable to demonstrate any marked pathogenicity in the organisms isolated, and since controls show that bacteriuria is widespread amongst Europeans and Africans in Sierra Leone, it follows that its mere presence in cases of blackwater fever cannot be regarded as evidence that it bears any causal relationship to the disease. Further, the results obtained prove that a combination of chronic malaria undergoing treatment with quinine and associated with bacteriuria does not necessarily result in blackwater fever, for several of our European control cases presented this combination, although in these cases the concentration of bacteria was low. In addition, some of the controls, who at the time of examination were similarly excreting a small number of bacteria in their urine but were not suffering from malaria, subsequently contracted malaria without developing haemoglobinuria.

" The remarkably high bacterial concentration which we have recorded in some of our active and recovered blackwater cases is the only feature which we have not observed in the series of control cases. Whether the high bacterial concentration in the urine in these cases was a mere coincidence, or whether it played any part in the causation of the disease, cannot be determined without examining a larger number of cases." *W. Y.*

Bensis (W.) & Gouttas (A.). Bilieuse hémoglobinurique grave au cours d'un paludisme secondaire en activité, avec anurie déclenchée manifestement par traitement quininique. Trève paludéenne pendant l'étape anurique. Reprise d'activité paludéenne après rétablissement de la diurèse. Rechute hémoglobinurique après reprise du traitement quininique progressif. Nouvelle poussée paludéenne finalement jugulée par l'atébrine. Guérison définitive, [**A Case of Blackwater Fever with Clinical Details.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1935. Nov. 25. 51st Year. 3rd Ser. No. 29. pp. 1525–1529.

This describes in detail the clinical course of a patient suffering from malaria who developed blackwater fever. The patient became anuric, but the flow of urine gradually returned ; parasites persisted in the

blood, and after a few days there was an increase in number accompanied by a malarial paroxysm. Quinine was given, and this was followed by a recrudescence of haemoglobinuria. Some days later, after the haemoglobinuria had disappeared, there was another attack of malaria. This was treated by atebrin and plasmoquine, and the patient recovered. *W. Y.*

Seaton (S. P.). **Blackwater Fever in Hainan.**—*Chinese Med. Jl.* 1935. Aug. Vol. 49. No. 8. pp. 792–796.

Blackwater fever is comparatively rare in China, only occurring in Formosa, Yunnan and Hainan, although occasionally a case is recorded from the Southern ports. Since 1932 several cases have come each year to the Mary Henry Hospital, Nodoa, Hainan Island. They have all come from the market town of Namfong, 8 miles from Nodon, and from its neighbouring village of Lokaga.

Histories are given of 7 patients belonging to two families. *W. Y.*

Krishnan (K. V.) & Pai (N. G.). **The Aetiology of Blackwater Fever.**—*Indian Med. Gaz.* 1936. Mar. Vol. 71. No. 3. pp. 121–127. [25 refs.]

This paper is in itself a review and contains nothing new. The author summarizes his argument as follows :—

" Blackwater fever is not an independent disease but a manifestation of malaria. In its causation probably a special ' biological strain ' of the malarial parasite is concerned. This strain is important not by virtue of its toxinogenic property but rather on account of its distinct biochemical activity. The peculiar mode of attack of the parasite on the host, for purposes of obtaining its food requirements, probably leads indirectly to the production of haemolysis and haemoglobinuria. This assumption recognizes the prime importance of the host factor not only in inducing this ' biological ' variation in the parasite but also in producing the predisposition to haemolysis and haemoglobinuria. The two most important predisposing factors are a damaged reticulo-endothelial system and a diminution in free cholesterol involving both the red cells and the plasma, the latter determining the extent of haemolysis and the former the degree of haemoglobinuria. The sudden severe intravascular haemolysis is explained not merely on the basis of physical alterations but rather by the presence of a haemolysin. It is suggested that this haemolysin is the end result of a damaged liver and alterations in metabolism of both carbohydrates and fats, and that possibly it is of the nature of an unsaturated fatty acid or a lyso-lecithin." *W. Y.*

i. Kubo (M.). **Experimental Research into the Etiology of Blackwater Fever. On the Combined Action of the Products of Erythrolysis and of Quinine as a Causative Factor of Haemoglobinuria.**—*Taiwan. Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1935. Sept. Vol. 34. No. 9 (366). [In Japanese pp. 1438–1510. With 17 charts. [67 refs.]. English summary p. 1511.]

ii. ——. **Experimental Research into the Action of Glucose as an Inhibitory Agent in Quinine Haemolysis.**—*Ibid.* Oct. No. 10 (367). [In Japanese pp. 1749–1764. [11 refs.] English summary p. 1765.]

i. This paper describes experimental work undertaken with the object of elucidating the part played by quinine in the production of blackwater.

A 10 per cent. solution of rabbit red cells was prepared in distilled water, and the solution was then made isotonic by the addition of

sodium chloride. Isotonic solutions of quinine hydrochloride containing, respectively, 8 per cent., 6 per cent., 4 per cent. and 2 per cent. of quinine HCl were likewise prepared. The laked red cell solution was injected into the marginal ear of a rabbit in a dose of 4 cc. per kilo of body weight, and at the same time 1 cc. per kilo of one of the quinine solutions was injected into the portal vein.

When the concentration of the quinine solution was 6 or 8 per cent. the amount of haemoglobin excreted in the urine markedly exceeded the amount injected, but this was not the case with the lower concentrations of quinine. If the reticulo-endothelial system was blocked the amount of haemoglobinuria was still further increased.

It is concluded that the genesis of blackwater is as follows :—

Malaria causes a breakdown of erythrocytes in the blood and the products of disintegration lead to a further destruction of red cells on administration of quinine. The process is aided by the fact that the melanin and haemosiderin associated with malaria are deposited in the reticulo-endothelium and cause a paralysis and blockade of the functions of this system. [Even if the experimental facts described above are correct it is very doubtful if the explanation of the production of blackwater is adequate. There is no evidence that the reticulo-endothelial system is paralysed by the chronic malaria which habitually precedes blackwater : all the evidence points in the other direction, *viz.*, that it is in a state of proliferation and hyperactivity.]

ii. Experiments were undertaken to investigate the basis of the reputed beneficial effect of the intravenous injections of glucose solutions in blackwater fever.

The author repeated the *in vitro* experiments of Kondo and was able to confirm that glucose possesses the power of inhibitory action on the haemolysis of red cells by quinine. He then extended his investigations to animal experiments and was able to show that the injection of 10 cc. of a 5·4 per cent. solution of glucose per kilo. of body weight caused a diminution in the amount of haemoglobinuria produced by experiments of the kind described in the previous paper.

From this it is concluded that the efficacy of glucose as a therapeutic agent in blackwater depends upon the fact that it has an inhibitory action on the haemolysis of red cells by quinine. *W. Y.*

Budelmann (G.) & Krauel (G.). Zur Frage der paradoxen Chininwirkung. [**The Question of the Paradoxical Action of Quinine.**]—*Klin. Woch.* 1936. Feb. 15. Vol. 15. No. 7. pp. 225–227. With 2 figs. [18 refs.]

Quinine usually causes a fall in temperature and this is specially marked in pyrexial cases. The fall is supposed to be due to a lowering of the chemical energy of the protoplasm of all cells. Occasionally, however, the administration of quinine is followed by an increase of temperature, and the cause of this paradoxy is unknown.

Details are given of a patient (mitral stenosis and hyperthyroidism) in whom the administration of chinidin was attended by a rise of temperature two hours later. Altogether the patient was given 4 doses, each of 0·1 gm., of chinidin, and on each occasion there was a rise of temperature to 40°C. and a rigor. It is recorded that v. Müller obtained this paradoxical reaction in two cases of Basedow's disease.

It occurred to the authors that the rise of temperature might be due to a haemolytic action of the chinidin, and accordingly they sought for evidence of this. No trace of haemoglobin was, however, found in the

urine. Attempts were then made to produce evidence of quinine haemolysis through investigations of the patient's serum ; the red cells of the patient showed a perfectly normal resistance to hypotonic saline. Experiments were performed with the aid of a Pulfrich's refractometer. Immediately after mixing quinine 0·4 gm., normal saline 10·0 gm., and whole bood 60 cc., the refractometer value was 54 ; two hours later it had risen to 59·5, and the serum was deeply stained with haemoglobin. Observations were next made on the patient himself before and at various intervals after the administration of 0·1 gm. of chinidin. Before the administration of the drug the refractometer value was 52, and afterwards it rose to 56 ; the temperature rose from 36°C. to 39·5°C. The rise in the refractometer value preceded the rise of temperature.

The authors are of opinion that they have produced some evidence that the rise of temperature which occasionally follows the administration of quinine is due to a quinine haemolysis. *W. Y.*

Chopra (R. N.), Sen (B.) & Bhattacharya (S. N.). **A Case of Quinine Haemoglobinuria.**—*Indian Med. Gaz.* 1935. Aug. Vol. 70. No. 8. pp. 453–454.

The patient, a girl of 11, was admitted to hospital with a history of repeated attacks of malaria and occasional attacks of blackwater. The patient was anaemic, the spleen and liver were enlarged, but there was no fever. Six weeks before admission she had an attack of blackwater 4 hours after a dose of quinine. Three weeks later she again had an attack of malaria, and although no quinine was given she passed black-coloured urine ; this lasted for a week and then subsided. The girl was then sent to hospital for investigation and treatment. Microscopic examinations of the blood and faeces were negative ; the urine contained no haemoglobin, but gave a definite urobilin reaction. Other examinations of the blood showed (*a*) increased fragility of the red cells, (*b*) reduction in the electric charge of the corpuscles, (*c*) diminution in serum albumen, but increase in the euglobulin, pseudoglobulin, cholesterol and calcium contents.

In order to see whether quinine had any effect in bringing about haemoglobinuria, 6 grains in two equal doses were given by the mouth on 16th January. Blackwater was passed shortly afterwards, but was not accompanied by fever or general symptoms. On 30th January three doses of atebrin, each of 0·1 gm., were given, and on 1st February the same dose of atebrin with 0·0099 gm. of plasmoquine. The urine remained normal. On 5th February 6 grains of quinine failed to produce blackwater, but on 10th February 3 doses of quinine, each of 3 grains, were followed by a short attack of haemoglobinuria. *W. Y.*

Bjørn-Hansen (Haakon). Ueber die paroxysmale Kälte-hämoglobinurie. Mit besonderm Hinblick auf die leukozytären Blutveränderungen, die Hämolyse und den Blutdruck im Anschluss an experimentelle Abkühlungsversuche. [**Paroxysmal Haemoglobinuria. With Special Reference to the Leucocyte Changes, the Haemolysis, and the Blood Pressure in the Course of Experimental Cooling Experiments.**]—*Acta Med. Scandinavica.* 1936. Vol. 88. No. 2–4. pp. 129–179. With 6 charts & 2 figs. [51 refs.]

Four patients suffering from paroxysmal haemoglobinuria were studied in considerable detail during attacks produced experimentally by cooling.

All patients exhibited a leucopenia within 10 to 15 minutes; this was independent of any general paroxysm or of the passage of haemoglobinuria. The lowest leucocyte count, *e.g.*, a fall from 10,000 to 2,100 or from 10,100 to 6,500, was observed about 20 minutes after the commencement of the cooling; the leucopenia lasted some hours or only 20 to 30 minutes, and then the number of leucocytes rose and returned to normal or even rose beyond this value. Sometimes the leucocyte formula was unchanged and at others there was a relative neutropenia. Often there was a shift of the Arneth count to the left. In some experiments the eosinophil leucocytes disappeared completely from the blood. The leucocytosis which sometimes followed the leucopenia was due to an increase in the neutrophils, which in part consisted of young cells.

When a tourniquet was applied to the arm and the limb cooled at 3°C. for 5 mins. and then warmed at 38°C. for 15 mins., the blood showed, besides the haemolysis described by EHRLICH, a pronounced leucocytolysis. The number of leucocytes varied from 6,100 to 10,500 and sometimes the disintegration had proceeded to such an extent that it was impossible to differentiate the cells one from another. The leucocytes in the general circulation were unchanged, but within 20 minutes after the tourniquet was removed there was found to be a distinct leucopenia and a pronounced phagocytosis of haemolysed red cells. *In vitro* experiments with oxalated or citrated blood produced a similar leucocytolysis. The arm immersion experiments were usually quickly followed by a typical paroxysm, *i.e.*, albuminuria, haemoglobinuria and a rigor. Stress is laid on the fact that nothing happened until the tourniquet was removed and the cooled blood allowed to flow into the general circulation.

The author's experiments supported the teaching of LICHTHEIM in so far as a definite haemoglobinaemia always appeared some time before the paroxysm; but they also showed that, in addition to the haemolysis, there was a leucocytolysis and that this also probably played an important part in the production of the general symptoms. Various authors, *e.g.*, WIDAL, SALÉN, etc., have shown that in paroxysmal haemoglobinuria there may be a marked paroxysm associated with leucopenia, but without haemoglobinaemia. *W. Y.*

MARSCHALL (Fred). Hämoglobinurie und Nierenveränderungen bei Bartonellenanämie entmilzter Ratten und bei Affenmalaria in ihrer Beziehung zum menschlichen Schwarzwasserfieber. [**Haemoglobinuria and Renal Changes in the Bartonella Anaemia of Splenectomized Rats and in Monkey Malaria in Relationship to Human Blackwater Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1936. Apr. Vol. 40. No. 4. pp. 151–160. With 4 figs. [16 refs.]

Nine of 14 splenectomized rats suffering from an acute Bartonella infection exhibited haemoglobinuria. The renal changes found in these rats coincide with those found in monkeys infected with *P. knowlesi*. In both cases the kidneys exhibited more or less severe epithelial degeneration depending upon the degree of haemoglobinuria. A full description of these lesions is given and the appearances are illustrated in 4 microphotographs. They seem to resemble very closely those found in blackwater fever in man.

The general conclusion reached is that this work furnishes additional evidence that the site of haemolysis in blackwater fever is not the

kidneys but the circulating blood. The haemoglobin in the plasma is excreted through the epithelium of the convoluted tubules. [This view was put forward by the reviewer nearly 30 years ago as the result of his experimental investigations on the excretion of haemoglobin by rabbits injected intravenously with solutions of their own haemoglobin.] *W. Y.*

Ponder (Eric) & Abels (Julius C.). **Effect of Quinine Hydrochloride on Resistance of Rabbit Red Cells.**—*Proc. Soc. Experim. Biol. & Med.* 1936. Mar. Vol. 34. No. 2. pp. 162–165.

The purpose of this paper is to show that red cells of rabbits receiving quinine HCl in proper amount are less resistant to lysins such as saponin and sodium taurocholate used *in vitro*. The experiments fall into two groups :—(*a*) *in vitro* experiments, which show that quinine HCl is a simple haemolysin, and (*b*) *in vivo* experiments, which show that the resistance of the animal's red cells is lessened by the administration of the quinine salt.

In vitro experiments.—The addition of quinine HCl to systems containing saponin or sodium taurocholate produces a marked acceleration of haemolysis, and this can be measured by the usual methods (Ponder, 1934). If the red cells are left in contact with 1 : 100 quinine HCl for 10 minutes (after which time there is no haemolysis), and then washed and re-suspended, the resulting suspension has a smaller resistance to saponin or taurocholate than has an untreated suspension. The authors' explanation of the phenomenon is that the quinine salt combines with some component of the cell membrane, transforming it sufficiently to bring about haemolysis if the concentration of the quinine is great, and transforming it partially, but sufficiently to decrease its resistance to a subsequently added lysin if the concentration of quinine is less.

In vivo experiments.—In these quinine HCl was given to rabbits in varying dosage and over various periods, and the resistance of the animals' red cells to saponin and to taurocholate was measured at intervals. The experiments are described and the results shown in tables. It was found that successive administrations of quinine HCl bring about a decreased resistance of the red cells to saponin and to taurocholate used *in vitro*. The fall of the red cells and the increase of reticulocytes which occur in the blood of animals dosed with suitable amounts of quinine HCl is probably due to an intravascular lysis, brought about by intravascular lysins present in the blood stream (*e.g.*, bile salts and the unidentified lysins of urine) the action of which is accelerated by the quinine. It is unlikely that the quinine salt itself produces intravascular lysis because a sufficient concentration is never reached in the blood stream. *W. Y.*

Krishnan (K. V.), Ghosh (B. M.) & Bose (P. N.). **Cholesterol Changes in Monkey Malaria and Haemoglobinuria.**—*Records of the Malaria Survey of India.* 1936. Mar. Vol. 6. No. 1. pp. 1–12. With 1 chart. [25 refs.]

The cholesterol content of the blood of man suffering from malaria and blackwater fever has frequently been studied. As a rule a hypocholesterinaemia has been recorded, but occasionally no change from

normal has been found. The inconclusive results obtained in blackwater fever may be partly accounted for by the fact that the examinations were made after the onset of the disease and not prior to it. As the onset of blackwater fever cannot be predicted it is not possible to determine the cholesterol value immediately prior to the condition. In experimental animals this difficulty is not met with because *P. knowlesi* causes in *Silenus rhesus* an acute and intense infection terminating in haemoglobinuria and death within a short period, especially if the animals are splenectomized. This paper records observations made on the cholesterol changes taking place in infected *Silenus rhesus* from the commencement of infection to its termination.

Some of the monkeys were splenectomized in order to intensify the infection and bring on haemoglobinuria. Samples of blood were taken at all stages of the infection and the amount of cholesterol in the whole blood was estimated by Sackett's (1925) modification of Bloor's method. In all 16 monkeys were used, and during the period of the experiment the animals were kept on a standard diet.

The authors summarize their results as follows :—

" The normal blood cholesterol values in *Silenus rhesus* monkeys varied from 143 to 214 mg. per cent. and the average was 177 mg. per cent.

" After infection with *Plasmodium knowlesi* and during the incubation period, no appreciable change was noticed. The value varied from 120 to 213 mg. per cent. and the average was 171·5 mg. per cent.

" During the primary parasitological period of infection, great fluctuations occurred in the cholesterol level. The value varied from 107 to 250 mg. per cent. and the average was 150 mg. per cent. The impression gained was that towards the end of the parasitological period, when the infection was intense, there was a distinct tendency for the cholesterol to diminish in the majority of instances. The values at this stage varied from 107 to 150 mg. per cent. and the average was 125 mg. per cent.

" After quinine treatment and prior to recovery, the cholesterol value generally rose up to normal or slightly higher than normal ; while the average value prior to quinine was 125 mg. per cent. it was 194 mg. per cent. after quinine. This represents an average rise of 55 per cent.

" In latency cholesterol values were low but they rose prior to the occurrence of relapse. The average value early in latency was 125 mg. per cent., but prior to onset of relapse it rose to 170 mg. per cent. Increase of cholesterol invariably preceded the onset of relapse.

" During relapse, when the intensity of infection was increasing, the cholesterol value fell markedly unless treatment was given. The value during relapse varied between 97 and 176 mg. and the average was 135 mg. per cent. After treatment the average rose to 169 mg. per cent. This represents a rise of 25 per cent.

" During relapse the cholesterol value was lower than during the primary infection. In the later relapses the values were lower than in the earlier relapses. In chronic long standing malaria a condition of hypocholesterinaemia was seen.

" Twenty-four hours prior to the onset of haemoglobinuria a condition of hypocholesterinaemia was noticed in 4 out of 6 attacks, the cholesterol values being 80, 90, 90, 110 mg. per cent. In the other two attacks the values were normal (150 and 175 mg.). This shows that haemoglobinuria may occur both when the cholesterol value is normal or subnormal.

" In 2 out of 3 monkeys that did not develop haemoglobinuria despite an intense infection, a condition of hypocholesterinaemia occurred (the values were 100 and 125 mg. per cent.). Hypercholesterinaemia during intense infection was not always followed by haemoglobinuria.

" A rise in cholesterol to or above normal values, or a persistence of normal values after occurrence of haemoglobinuria, invariably resulted in

the disappearance of the condition. The values obtained when haemoglobinuria disappeared were 100, 150, 170, 180 and 200. Cholesterol is capable of exerting an inhibiting influence on haemolysis and haemoglobinuria resulting from intense malarial infection in monkeys. *W. Y.*

Otto (I. H.). Zur Behandlung des Schwarzwasserfiebers mit Campolon. Nach H. E. Naumann. [**The Treatment of Blackwater Fever by Campolon.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. Oct. Vol. 39. No. 10. pp. 422–425. [10 refs.]

Details are given of two cases of blackwater treated with large doses of campolon ; both patients made a speedy recovery. The author lays stress on the fact that he gave his patients campolon alone and not together with glucose and insulin, as recommended by Naumann [this *Bulletin*, 1935, Vol. 32, p. 200]. Blood regeneration was rapid ; in one of the patients the red cell count rose from 1,980,000 to 4,700,000, and the haemoglobin value from 45 per cent. to 79 per cent. within 18 days.

W. Y.

Naumann (H. E.). Schwarzwasserfieber-Behandlung. [**The Treatment of Blackwater Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1936. Feb. Vol. 40. No. 2. pp. 73–76.

Details are given of 10 cases of blackwater fever treated with atebrin and campolon injections ; since all recovered the author believes that this is the treatment of choice.

In reaching a decision upon the proper treatment of this disease, the author states that he kept four points in mind, *viz.* :—(1) Malaria ; (2) damage to the red cells ; (3) damage to the liver ; and (4) blockade of the renal tubules. The last of these is without doubt a secondary phenomenon and therefore for the present purpose can be neglected. The first factor is treated with atebrin alone, thereby eliminating the unpleasant consequences of quinine and plasmoquine, and the second by large doses of campolon. Great importance is attached to bolstering up the liver function, and the author is now inclined to omit the insulin and glucose previously used by him [this *Bulletin*, 1935, Vol. 32, p. 200] and to rely solely upon campolon, which, besides being a powerful stimulant of the haematopoietic system, exerts a specific action upon the liver function.

W. Y.

Hauer (August). Beitrag zur Behandlung des Schwarzwasserfiebers. [**The Treatment of Blackwater Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1936. Feb. Vol. 40. No. 2. pp. 76–81.

A detailed account is given of a case of blackwater fever treated successfully with intravenous injections of calorose, strophanthin and insulin, and with intramuscular injections of campolon. Although the general result of this treatment is said to to have been excellent, stress is laid on the fact that vomiting continued for 36 hours, necessitating the hourly administration of chloroform water. The author discusses the relative value of intramuscular and intravenous injections of liver extract. He considers that the intramuscular injection leads to the formation of a depôt which is utilized with different speeds by different individuals. When the material is given intravenously its action is much quicker. In severe forms of anaemia due to chronic sepsis the author has found that the intravenous injection of 20 cc. of

" Hepatrat ad infusionem " is well tolerated. He emphasizes the fact that the forms of liver extract usually employed for intramuscular injection are not suitable for intravenous administration because they contain certain substances which act on the circulation and may produce the most dangerous shock. The ordinary preparations of liver extract contain small quantities of histamin, but only those which are entirely free from this substance are suitable for intravenous use. He arranges the various liver extracts according to their content of substances acting on the circulation as follows :—hepatopson 15, campolon 25, pernämyl 45, hepatrat 5, and hepatrat ad infusionem 0.

Details are also given of a patient with malaria, who, whilst improving under a course of atebrin and plasmoquine, was given three applications of short ultra-violet rays because of his enormously enlarged spleen. The radiation appeared to be associated with a definite deterioration of the patient's condition. The spleen decreased considerably in size, but the patient complained of pain in the splenic area, and there was a very considerable fall in the red cell count and haemoglobin value. *W. Y.*

CORMAN (A.). L'atébrine et les extraits hépatiques dans le traitement de la fièvre bilieuse hémoglobinurique (dix observations personnelles). [**Atebrin and Liver Extract in the Treatment of Blackwater.**]—*Bull. Méd. du Katanga.* 1935. Vol. 12. No. 3. pp. 93, 95–101, 103–108.

Details are given of ten cases of blackwater fever treated with atebrin and liver extract (campolon). It is noted that 8 of these cases had taken prophylactic quinine regularly prior to the onset of blackwater. Only one of the patients treated in this way died, as compared with 7 deaths among the 13 cases treated by other methods previously. All evidence of haemolysis had disappeared within 4 days and the rapidity with which the blood regenerated was striking. *W. Y.*

DANG-HANH-KIÊN. Contribution au traitement de la fièvre bilieuse hémoglobinurique par les injections d'urotropine. [**The Treatment of Blackwater Fever by Urotropine.**]—*Bull. Acad. Méd.* 1935. Oct. 15. 99th Year. 3rd Ser. Vol. 114. No. 32. pp. 282–288.

Details are given of 8 cases of blackwater fever treated by urotropine ; all recovered. The author states that, in his opinion, urotropine is not without action in this disease, but how it acts he does not know.

[The reviewer is quite prepared to admit the truth of the last portion of this sentence, but he is not so certain about the first portion.]

W. Y.

MOSTERT (H. v. R.). **Observation on Quinine Prophylaxis and Blackwater Fever in Central Africa.**—*South African Med. Jl.* 1935. Dec. 14. Vol. 9. No. 23. pp. 827–832. With 1 chart. [21 refs.]

The value of quinine as a prophylactic against malaria is a matter of paramount importance, but unfortunately one that has been the cause of much controversy in recent years. WATSON in Malaya and RUSSELL in the Philippines hold that the drug as a prophylactic has been a failure, whilst in the opposite camp are many experienced workers.

The experimental work of YORKE and MACFIE [this *Bulletin*, 1925 Vol. 22, p. 50) has shown that in artificially induced malaria quinine is not a true prophylactic. The author doubts, however, whether conclusions drawn from such experiments can be accepted as conclusive proof that the drug is useless as a prophylactic in the malarious areas of Central Africa.

Apparently different strains of *P. falciparum* vary in their sensitiveness to quinine ; and it may not be necessary for effective prophylaxis that the sporozoites must be destroyed, the regular taking of quinine may be sufficient to eradicate any trophozoites resulting from periodic infections. The crucial test is whether those physicians, working in the highly malarious regions of Central Africa, have found the regular taking of small doses of quinine a protection or not against the disease.

The author's experience at the Nchanga Copper Mine in Northern Rhodesia is that prophylactic quinine has been an economic success and has enabled the bulk of the staff to give the maximum of useful labour to the Company. Of the 230 cases of malaria which have occurred among the European staff and dependants during the years 1929–1932, only 8 per cent. were regular quinine takers and 92 per cent. were either irregular takers or non-takers. Whether small regular doses of quinine render the blood completely free of parasites or merely repress the disease until such time as the health is below par is an important question. [It is, but the author does not seem able to throw any light on it.]

Mostert next passes to consider how far it is possible to dispense with quinine and rely purely on hygienic measures in a controlled area. His own experience at Nchanga taught him that in addition to sanitary measures the prophylactic use of quinine was indispensable.

Writing on the dangers other than malaria associated with the non-taking or irregular taking of quinine, Mostert says that in the Rhodesian copper fields the recurrent attacks of malaria which inevitably resulted in those who neglected to take their quinine regularly were often responsible for two serious complications, *viz.*, abortion in pregnant women, and blackwater fever. A summary is given of 32 cases of blackwater fever treated by the author. All give more or less the same history of not taking quinine or of taking it irregularly in the intervals between their bouts of fever.

The paper closes with some remarks on the treatment of blackwater fever.

W. Y.

AMOEBIASIS.

CRAIG (Charles F.). **Observations upon the Methods of Transmission of Amebiasis.**—*Amer. Jl. Public Health.* 1935. Nov. Vol. 25. No. 11. pp. 1231–1236.

This article though bringing forward no new evidence is worth study because it puts into proper perspective the ways in which amoebic infection may be contracted. The Chicago outbreak of 1934, owing to its seriousness, has somewhat tended to swing the balance too much to the side of the " water-borne " disease. This outbreak did not bring to light any fresh epidemiological evidence—it merely showed that cross-connexion between polluted water or sewage and the domestic water supply was fraught with danger, a fact quite well-known already. In paying attention to this we must not forget or minimize the dangers of infected food-handlers, flies, vegetables contaminated by sewage, etc. [see also this *Bulletin*, 1935, Vol. 32, p. 189.]

H. H. S.

O'CONNOR (Francis W.). **Dissemination of Amebiasis.**—*Arch. Intern. Med.* 1935. June. Vol. 55. No. 6. pp. 997–1000.

A paper dealing at first with the life history of *E. histolytica* and its usual mode of spread, leading up to a consideration of the Chicago outbreak in 1933 and showing how the earlier ideas that the infection was spread by food-handlers proved later to be erroneous. A good general epidemiological address. [See *Bull. of Hyg.*, Vol. 9, pp. 178, 278, 315.] *H. H. S.*

NAUSS (Ralph W.) & SALINGER (May H.). **Amebic and Other Intestinal Protozoal Infestations in Representative Groups of New York City.** —*Amer. Jl. Public Health.* 1935. July. Vol. 25. No. 7. pp. 819–828. [22 refs.]

The examination by direct microscopical methods on a single occasion of 270 individuals in New York City gave an incidence of intestinal protozoa of 9·1 per cent. with 1·1 per cent. for *E. histolytica*. A group of 222 food handlers gave figures of 31·9 and 5·4 for a single examination. As the result of the re-examination on one or two occasions of a number of individuals out of the 222 food handlers it is concluded that the actual *E. histolytica* infections in this group might possibly have been between 9 and 10 per cent. instead of 5·4 per cent., the figure given by the single examination. Cultures were obtained of all the culturable forms on Cleveland's medium and it was noted that *Dientamoeba fragilis* and *Endolimax nana* appeared on a number of occasions.

The significance of the relatively large number of individuals infected with *E. histolytica* in the absence of symptoms is discussed. It is suggested that symptoms may appear only when certain bacteria are present. In support of this it is noted that an old culture of *E. histolytica* failed to infect kittens till it was inoculated together with a broth culture of a haemolytic variety of *Bact. coli*. *C. M. Wenyon.*

KABLER (Paul). **Incidence of Infection with Intestinal Protozoa in Minnesota.**—*Amer. Jl. Med. Sci.* 1935. July. Vol. 190. No. 1. pp. 103–106. [14 refs.]

The examination was conducted on 146 " healthy working food handlers of a large railway system." Each individual was examined after the administration of a saline cathartic on one occasion only. One or more of all the common intestinal protozoa were found in 24·67 per cent. ; *Entamoeba histolytica* giving the low figure of 1·37 per cent.

C. M. W.

CONNELL (Frank H.). **Amebiasis in a Rural Community.**—*New England Jl. of Med.* 1935. Oct. 17. Vol. 213. No. 16. pp. 748–750.

The author undertook the examination of faeces of 700 students, freshmen at Dartmouth University, New Hampshire, U.S.A. The subjects came from various parts of the States and were apparently in good health. The examination has not yet been completed but so far he has found six to be infected with *E. histolytica* and 14 were passing *Giardia lamblia.* Among 63 townspeople examined at the laboratory during the past 3 years there were none with *E. histolytica* and only 2 with Giardia. The proportion is almost certainly greater than the former figures would indicate for, by faecal examination only and particularly when the number of specimens is limited (in these persons to two each) others would be missed. All those found to be cyst-passers in the college group were given carbarsone 0·25 gm. twice a day with grain 1/2 of emetin for 10 days. This treatment " produced stools that were free from cysts and amoebae, and have continued to remain free."

H. H. S.

AUSTIN (T. A.) & MAYNE (L. C.). **A Review of the Incidence of Amoebiasis in Zomba, with Special Reference to European Cases.**—*Nyasaland Protectorate Ann. Med. & San. Rep. for Year ending 31st December, 1934.* Appendix III. pp. 73–82.

Dysentery has been recorded in Nyasaland in Annual Reports for nearly a quarter of a century, but proper scientific investigation regarding the prevalence has only recently been undertaken. SHELLEY in 1932–33 examined the faeces of 1,123 residents of Zomba, 279 Europeans and 844 Africans, and found 21·8 per cent. of the former and 3·5 per cent. of the latter to be infected with *E. histolytica.* In 1932 twelve cases were reported, in 1933 twenty-two (6 in December) and in 1934 thirty-three (14 in December), *i.e.*, more in the early part of the rainy season, when flies are abundant. In Zomba, Nyasaland, the rainy season extends from November to April and is heaviest in January and February. Native servants live in compounds surrounding the European residences. The water supply is now a pipe-borne gravity supply. Food is abundant and varied, but vegetables are not regarded as safe from contamination unless their place of growth is known (*e.g.*, small vegetable gardens of European residents). In March and April 1934, 427 faecal specimens from house servants of Europeans were examined (fifteen householders were so short-sighted as to refuse any examination) and 7 contained *E. histolytica.* During the last 9 months of 1934, 405 prisoners were examined, one was passing *E. histolytica* and

40 were cyst passers ; and in 9 of 97 specimens from inmates of the Central Lunatic Asylum the cysts were found.

Disposal of night soil in Zomba is not satisfactory and flies are many. Rectification of the sewage disposal, cutting down banana groves where promiscuous defaecation occurs and of mango trees, a source of decaying pabulum for flies, will do much to eliminate the fly nuisance.

There are three clinical types of amoebiasis in Zomba : acute dysentery, diarrhoea and abdominal discomfort, and amoebic hepatitis. With few exceptions the disease is of a mild type. Infection is far from rare in children ; 11 cases were recorded under the age of ten years in 1934–1935 in 54 weeks, and in them the onset is more severe than in adults, with higher fever and sometimes with vomiting.

The best treatment has been found to be a combination of emetine hydrochloride injections intramuscularly 1 grain daily for 8–10 days and a daily enema of 200 cc. of a 1 per cent. solution of quinoxyl. Emetine periodide was tried but was badly tolerated and discontinued. To children emetine was not given but $\frac{1}{4}$–$\frac{1}{2}$ tablet [strength not stated] of quinoxyl thrice daily by mouth for 10 days and 0·5–1·0 per cent. quinoxyl enemata. *H. H. S.*

Austin (T. A.) & Mayne (L. C.). **A Review of the Incidence of Amoebiasis in Zomba, with Special Reference to European Cases.**—*East African Med. Jl.* 1935. June. Vol. 12. No. 3. pp. 68–88.

Dysentery has probably been endemic in Nyasaland for a long time. More than a quarter of a century ago the Medical Officer of Zomba remarked that dysentery was one of the principal diseases among Europeans. Not till ten years ago, however, was any distinction made in the Annual Report between the different types of dysentery. Coming to more recent times, in 1933 Dr. H. M. Shelley examined 279 specimens of faeces from Europeans and 844 from Africans and found the amoeba in 21·8 per cent. of the former and 3·5 per cent. of the latter [see also this *Bulletin*, 1934, Vol. 31, Supp. p. 58*]. European cases of amoebic dysentery in Zomba have increased in the last three years, the figures being 12, 22, and 33 respectively. The infection is more prevalent in the rainy season, most cases being reported in December. Though not definitely recorded as occurring among children, until 1933, the fact that certain cases of so-called enteritis in children were in houses where one or other parent had suffered from dysentery is at least suggestive ; during 54 weeks from January 1st, 1934, eleven cases were reported in children under 10 years. The prevalence of flies and the general state of sanitation (or absence of it especially among native women and children) were certainly favourable to the multiplication of vectors and spread of infection. Now that improved methods of sanitation have been introduced there is every probability of a marked reduction in the number of cases in the future. [See preceding abstract for other details.] *H. H. S.*

Alexander (Frank D.) & Meleney (Henry E.). **A Study of Diets in Two Rural Communities in Tennessee in which Amebiasis was prevalent.**—*Amer. Jl. Hyg.* 1935. Nov. Vol. 22. No. 3. pp. 704–730. [22 refs.]

A survey of the diets in one community (Hatchie) where acute amoebic dysentery was common and in another (New Hope) where it

was very rare, although 40 per cent. harboured *E. histolytica*, was made. Hatchie is situated in the plains and contains whites and negroes, New Hope in the hills and contains whites only. New Hope households consumed diets superior to those of Hatchie in the following respects :— variety of major foods, consumption of sweet milk, fruits and green vegetables, caloric intake, vitamins A, B_1, B_2, C and D intake. In both communities protein intake was at a standard level, but the fat intake was below standard (24 per cent.—standard, 36). There were wide variations in the number of foods used by individual households (from 10 to more than 30). In general the whites of Hatchie fared better than the negroes. None of the negro households used foods containing adequate amounts of vitamin D. A comparison of the winter and summer foods showed that the principal articles of food were essentially the same. There was no definite difference in the physique (height, weight, age-ratio), of the two communities and no correlation was found between caloric consumption and under- or over-weight. No correlation was found between dietary inadequacies and harbouring of *E. histolytica* in individual households. It is interesting, however, that in New Hope, where milk, greens and fruit were more abundantly eaten, the amoebae obtained were less pathogenic for kittens than strains from Hatchie. No clinical studies were made to determine whether any deficiency diseases existed. The large amount of corn-meal used by both communities was the most striking common feature of the diets. It would be beneficial if the poor rural people of the southern states would substitute other foods, particularly animal protein and vitamin-containing foods, for a large part of the corn meal.

H. N. H. Green.

Wenrich (D. H.), Stabler (R. M.) & Arnett (John H.). *Endamoeba histolytica* **and Other Intestinal Protozoa in 1,060 College Freshmen.** —*Amer. Jl. Trop. Med.* 1935. May. Vol. 15. No. 3. pp. 331–345. [19 refs.]

At a professional institution in Philadelphia a single stool specimen from each of 1,060 freshmen was subjected to examination for intestinal protozoa. Though the specimen had been obtained without the use of a laxative one or other of the usual intestinal protozoa were found in 34·5 per cent., 4·1 per cent. showing *Entamoeba histolytica*. The percentage of *E. histolytica* for Philadelphia and its suburbs was 5·2, a figure higher than that for other parts of that State. The cases of *E. histolytica* infection appeared to be as healthy as those giving a negative result, while no cases of amoebic dysentery were detected during the three years of this investigation. It is of interest that the supposedly rare *Dientamoeba fragilis* gave an incidence of 4·3 per cent.

C. M. W.

Purcaro (Giuseppe) & Elisei (Carlo). Reperto parassitario nelle feci di individui provenienti dalla Sardegna e dalla Sicilia con speciale riguardo all' amebiasi. [**The Presence of Amoebae in Faeces of Sardinians and Sicilians in Modena.**]—*Arch. Ital. Sci. Med. Colon.* 1935. Aug. 1. Vol. 16. No. 8. pp. 574–581. English summary (3 lines.)

The numbers examined were small, 50 Sardinians and 50 Sicilians, young persons who had never lived for any length of time in Modena.

Among the former 21 were excreting *E. histolytica*, 8 had symptoms of intestinal disturbance, 13 had none. Among the latter Entamoeba was found in 9, three with symptoms, 6 without ; *i.e.*, in 42 per cent. of the Sardinians and 18 per cent. of the Sicilians the parasite was found. Other parasitic findings—helminthic ova, Giardia, Blastocystis, Trichomonas—were noted in a few individuals only. *H. H. S.*

Matewossian (Sch. M.). Amoebiasis und ihre Endemie in Armenien. [**The Endemicity of Amoebiasis in Armenia.**]—*Arb. d. Tropeninstituts d. Volksgsndht. Kommissariat d. SSR. Armenien.* 1935. Vol. 2. [In Russian p. 346. German summary pp. 373–374.]

The extent of amoebiasis in Armenia is not known with any certainty, first because no accurate statistics are available, second because only the acute dysenteric form is known and, third, specimens are not always sent to a laboratory by which alone can correct diagnosis be made.

In the last 8 years in the protozoological section of the Tropical Institute, Eriwan, over 5,000 specimens of faeces have been examined and a considerable percentage were positive for *E. histolytica*. During the last 3½ years 20·6 per cent. of specimens from 714 adults and 6·4 per cent. of 408 children revealed amoebae ; all presented symptoms of acute or chronic intestinal disease. Examination of large groups of the population revealed 20 per cent. to be harbouring the amoeba.

H. H. S.

Zaturjan (A. T.). Protozoen-Infektionen des Darmtraktus im Kindesalter in Armenien. [**Intestinal Protozoa among Children in Armenia.**]—*Arb. d. Tropeninstituts d. Volksgsndht. Kommissariat d. SSR. Armenien.* 1935. Vol. 2. [In Russian p. 347. German summary p. 375.]

Amoebiasis in children is much less common than in adults and when present runs a more benign course, rarely showing any serious complications. Carriers were found in 6–7 per cent., " a much smaller proportion than among adults " [not stated in figures]. In 58·7 per cent. of children with *E. histolytica* there was also present *G. intestinalis*, and the latter was seen in 26·5 to 45·9 per cent. of children. The presence of the latter was accompanied by a chronic, relapsing type of enterocolitis, but not much constitutional disturbance. Balantidiosis was found in children who evidenced no symptom of disease, and when symptoms were present the course was benign. Up to the present time one case only of human coccidiosis (*isospora*) has been recorded in S.S.R.A. *H. H. S.*

Simíc (Tsh.). L'infection à protozoaires intestinaux des écoliers de Skoplje. [**Infection of School Children at Skoplje by Intestinal Protozoa.**]—*Ann. Parasit. Humaine et Comparée.* 1935. May 1. Vol. 13. No. 3. pp. 231–233.

The examination of 110 school children of 8 to 12 years of age for intestinal protozoa at Skoplje has given the following results :—*Entamoeba dispar* 44, *E. hartmanni* 14, *E. coli* 92, *Endolimax nana* 94, *Pseudolimax bütschlii* (=*Iodamoeba bütschlii*) 52, *Lamblia intestinalis* 27, *Trichomonas intestinalis* 44, *Chilomastix mesnili* 16, *Tricercomonas*

intestinalis 20. Some figures are given of the tolerance for heat and cold of a number of amoebae and flagellates, while the relative values of direct examination and culture methods for the detection of each form are given. It has to be remembered that the *E. histolytica* of most authorities is divided by the author into *E. dysenteriae*, *E. dispar* and *E. hartmanni*. Presumably *E. dysenteriae* was not found in the school children because none of them showed any symptoms. It is difficult to suppose that all the tests which the advocates of *E. dispar* consider necessary to distinguish it from the pathogenic form were applied in all of the 44 cases of infection. In another paper the author states that *E. dispar* can only be differentiated with certainty from *E. dysenteriae* after passages in laboratory animals. *C. M. W.*

Morcos (Z.). *Entamoeba histolytica* **in Dogs.**—*Jl. Egyptian Med. Assoc.* 1936. Feb. Vol. 19. No. 2. pp. 63–64.

The author quotes from the literature records of natural and experimental infection of dogs with *E. histolytica*, and goes on to state that at the Cairo Veterinary School all dogs suffering from diarrhoea or in a wasting condition are examined for helminthic or protozoal infection. Five cases have been reported in recent years, 3 from Giza, one each from Kobba and Heliopolis. All were passing watery, blood-stained stools and vegetative forms of *E. histolytica* were seen in each ; one of the first three was given emetine 0·03 gm. subcutaneously on 3 successive days [nothing is said of the other two from Giza] and the others had two Yatren pills daily for 10 days. The three whose treatment is mentioned recovered. *H. H. S.*

Reichenow (Eduardo). La cuestion de los portadores sanos de la amiba disentérica, *Entamoeba histolytica* y el valor patogeno en general de los protozoos intestinales.—*Medicina Países Cálidos.* Madrid. 1935. Sept. Vol. 8. No. 9. pp. 409–420.

Dopter (Ch.) & Deschiens (R.). Action comparée du sérum humain et du sérum de cheval sur les cultures de l'amibe dysentérique. [**Comparison of Human Serum with that of the Horse in the Cultural Growth of the Dysentery Amoeba.**]—*C. R. Soc. Biol.* 1935. Vol. 119. No. 27. pp. 1370–1373.

In the investigation described in this paper it was found that two strains of dysentery amoeba gave 5 times more growth when human serum was used instead of horse serum in the medium employed.

C. M. W.

Yosezato (Morio). **Investigations on Amoebic Dysentery. VIII. On a New Method for the Cultivation of** *Entamoeba histolytica*.—*Jl. Oriental Med.* 1935. Mar. Vol. 22. No. 3. [In Japanese pp. 467–474. With 1 chart. English summary p. 41.]

The author maintains that the substitution of 3 per cent. sodium citrate solution for Ringer's or Locke's solutions in the composition of media intended for the cultivation of *E. histolytica* is an advantageous procedure. *C. M. W.*

Deschiens (R.). Modification de la virulence pour le chat d'une souche d'amibes dysentériques conservée en culture. [**Effect of Cultivation of *E. histolytica* on its Virulence for Cats.**]—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 481–490. [12 refs.]

The author discusses the experiments of various observers who have attempted to prove that the virulence of *Entamoeba histolytica* does or does not diminish by culture in artificial media. He records observations which he has made with a strain of amoeba isolated from the stool of a case of dysentery which at the time of isolation proved virulent for kittens, for two of three animals inoculated per rectum with the stool developed amoebic dysentery. The amoeba was maintained in culture by subculturing every 5 days, and with cultures between the 90th and 220th day 10 kittens were inoculated per rectum and 13 into the ileum, after laparotomy, without one of the animals developing dysentery. It is concluded that a virulent strain of *Entamoeba histolytica* may lose this virulence during prolonged cultivation. *C. M. W.*

Gauducheau (A.). À propos de la phagocytose amibienne. [**On Phagocytosis by Amoeba.**]—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 420–422.

The paper refers to experiments carried out with an amoeba which the author has cultivated on agar from Saïgon water. When inoculated on to cultures of certain bacteria it destroys the bacteria very much as bacteriophage does. Certain bacteria are acted upon only if the amoeba is associated with *Bact. coli*. This amoeba, recently isolated, the author identifies with one he cultivated from human faeces in 1907 and which he named *Entamoeba phagocytoïdes*, believing it to be a form parasitic in the human intestine. He now refers to it as *Endolimax phagocytoïdes*, a name used by some observers for the parasitic *Endolimax nana*, which certainly does not grow on ordinary agar media.

C. M. W.

Garcia (Eusebio Y.). **Effects of Chlorinated Lime in Lethal Concentrations on *Entamoeba histolytica* Cysts.**—*Philippine Jl. Sci.* 1935. Mar. Vol. 56. No. 3. pp. 295–311. With 18 figs. on 1 plate. [13 refs.]

In estimating the length of survival of cysts of *Entamoeba histolytica* in water or solutions of disinfectants, reliance has been placed on the assumption that dead cysts stain with eosin or that living cysts will give rise to cultures of amoebae when brought into suitable culture media. Both these tests of variability the author regards as fallacious. He considers that direct observations on the cysts for evidence of internal degenerative changes in nuclei and cytoplasm, called by him necrobiosis, are more reliable. He finds that 3·5 parts per million of chlorine (resulting from the addition of calcium hypochlorite) produce destructive changes in the cysts which are enhanced rather than diminished by the presence of nitrogenous organic matter. This strength of chlorine, however, renders water unsuitable for drinking.

C. M. W.

Sumi (I.) & Inoue (K.). **Investigations on Amoebic Dysentery. VII. Simple Method for the Determination of Degenerated Trophozoite and Cysts of *E. histolytica* in the Feces.**—*Jl. Oriental Med.* 1935. June. Vol. 22. No. 6. [In Japanese pp. 1001–1009. [17 refs.] English summary pp. 88–89.]

The authors find that even after death *Entamoeba histolytica* can be distinguished from other cells by the character of the nucleus stained by mixing the material with 0·3–0·5 per cent. aqueous solution of methyl green. The nuclei of the amoebae take much longer to stain than do those of cells. Cysts in faeces can be concentrated by emulsifying 1–2 gm. of the stool in 30 cc. of sugar solution having a specific gravity of 1,070. Some of the supernatant fluid (5 cc.) is filtered through gauze and centrifuged, after which 1 cc. of the supernatant fluid is diluted with water and centrifuged. The deposit will contain the cysts.

C. M. W.

Penso (Giuseppe). Sull' individualità morfologica dell' *Entamoeba dispar* (Brumpt). [**Diagnosis of *E. dispar* on Morphological Grounds.**]—*Arch. Ital. Sci. Med. Colon.* 1935. Aug. 1. Vol. 16. No. 8. pp. 563–573. With 5 figs. [12 refs.] English summary (2 lines).

The author has undertaken the difficult task of comparing morphologically the amoebae which occur in cultures obtained from a case of *Entamoeba dispar* (the human amoeba, which though resembling *E. histolytica* morphologically, is supposed to be never pathogenic to man and cats) infection and those in cultures of *E. histolytica*. He concludes that these can be distinguished for various reasons, one of which is the eccentric position of the karyosome in a certain percentage of the amoebae in the *E. dispar* cultures. It seems that in the first place a diagnosis of *E. dispar* can only be made by attempting to infect cats and as these animals are not invariably susceptible to known *E. histolytica* the number of attempts is a matter of some importance. The author does not state how many attempts were made to infect cats with his strain. [Neither the originator of the idea that *E. dispar* was a species distinct from *E. histolytica* nor others who have adopted this view have made any claim that the two amoebae could be distinguished morphologically.] *C. M. W.*

Simíc (Tsh.). Infection expérimentale du chat et du chien par *Entamoeba dispar* et *Entamoeba dysenteriae*. Réinfection et immunité croisée du chien. [**Experimental Infection of Cats and Dogs by *E. dispar* and *E. histolytica*. Reinfection and Crossed Immunity in the Dog.**]—*Ann. Parasit. Humaine et Comparée.* 1935. July 1. Vol. 13. No. 4. pp. 345–350.

The author points out that the separation of *Entamoeba dispar* from *Entamoeba "minuta"* of the cycle of *E. dysenteriae* can be effected with certainty only after their passage in laboratory animals. By this statement the author means that an infection with *E. dispar*, which consists of small amoebae and 4-nuclear cysts morphologically similar to the carrier condition of *E. histolytica* infections, where small amoebae and 4-nuclear cysts also occur, can only be recognized by animal experiment in which the pathogenicity of the amoebae and cysts belonging to

E. histolytica contrasts with the relative lack of pathogenicity of those belonging to *E. dispar*. This view, if correct, would of course make it quite impossible to distinguish the carrier condition of *E. histolytica* from *E. dispar* by direct microscopical examination. It is further pointed out by the author that the experiments he describes in this paper indicate that the dog always recovers from an experimental infection due to *E. dispar* but only occasionally from one due to *E. dysenteriae*. Furthermore, the dog having recovered from an *E. dispar* infection cannot be reinfected with this amoeba though it can be infected with *E. dysenteriae*. Similarly one infection with *E. dysenteriae* usually but not always produces an immunity against this amoeba. When a dog is infected with *E. dispar* the infection lasts 6–8 days, whereas the infection with *E. dysenteriae* lasts 60–120 days. It has to be noted that only dogs under 6 months of age can be infected with *E. dispar*. The *E. dysenteriae* infection in dogs and cats is definitely pathogenic, producing ulcerations and amoebae with ingested red blood corpuscles. The *E. dispar* infection in these animals is quite benign. The author concludes that the dog is the most suitable animal in which to carry out experimental work with amoebiasis.

[To the reviewer it still seems futile to attempt to separate *E. dispar* from *E. histolytica* on the grounds of differences in pathogenicity. It seems to him that all the differences described can be more reasonably accounted for by the supposition that races of *E. histolytica* of varying virulence occur and that hosts vary in their susceptibility to the one species.] *C. M. W.*

Hakansson (E. G.). **The Use of Aqueous Smears in the Study and Identification of the Amoebae of Man.**—*Amer. Jl. Trop. Med.* 1935. July. Vol. 15. No. 4. pp. 439–453. With 29 figs. on 2 plates.

The author describes changes which occur in the intestinal amoebae of man when placed in water. The changes are not the same for each species so that they can be employed as an aid to diagnosis.

C. M. W.

Chang (Hsiao-ch'ien), Ch'en (Kuo-chen) & Chou (Shou-k'ai). **Further Observations on the Diagnosis of Amebic Dysentery.**—*Chinese Med. Jl.* 1936. Jan. Vol. 50. No. 1. pp. 17–26.

The authors' observations are based on a study of 50 cases of amoebic dysentery seen by them personally and on an analysis of 75 cases treated in the hospital wards. Among 45 cases of active amoebic colitis only 51 per cent. were confirmed by faecal examination, 49 per cent. needed the sigmoidoscope. In many of those in whose stools amoebae were found repeated examinations were required before a positive result was obtained, in two of them as many as 15. At the Peiping Union Medical College Hospital admissions for bacillary dysentery were ten times as numerous as those for the amoebic form. The latter was uncommon in children ; none were below 9 years of age and only four below 15 years. Frank dysenteric symptoms—passage of blood and mucus with tenesmus and colic—were present in two-thirds only ; in about half, the characters of the stools differed essentially from those of the bacillary form, but mixed infection with amoebic and bacillary

was present in about 7 per cent. The sigmoidoscope, they maintain, is the best and quickest means for diagnosis, it is " simple, harmless, and with care need not be unpleasant to the patient." *H. H. S.*

FABIANI (G.) & DENDALE (R.). Les réactions de gélification du sérum sanguin au cours de l'amibiase. [**Gelification of Serum in Amoebic Infections.**]—*Bull. Soc. Path. Exot.* 1935. July 10. Vol. 28. No. 7. pp. 556–557.

The humoral changes which occur with regularity in many chronic diseases, such as malaria, leishmaniasis, trypanosomiasis, tuberculosis, syphilis, leprosy, are non-existent in amoebic infections as manifested by the failure of sera to give positive gelification reactions with formol or lactic acid. Furthermore, the estimation in two cases of the total albumin of the blood and the albumin-globulin ratio gave figures which were approximately normal. *C. M. W.*

SPECTOR (Bertha Kaplan). **The Pathological Changes produced in the Intestines of Kittens by** *Endamoeba histolytica*, **with and without Certain Added Bacteria.**—*Amer. Jl. Hyg.* 1935. Sept. Vol. 22. No. 2. pp. 366–375. [20 refs.]

The incidence of amoebic infection and the severity of the lesions in kittens inoculated with *E. histolytica* are increased if the amoebae are inoculated along with certain freshly isolated bacteria such as haemolytic streptococci and pneumococci. These bacteria cease to have this effect after prolonged culture. *C. M. W.*

WILLIAMS (Pauline). **Amebic Abscess of the Liver. Report of Fatal Case in which Etiology was First Demonstrated in Tissue Sections of Diaphragm, following Autopsy. No Previous Manifestations of Amebiasis.**—*Southern Med. Jl.* 1935. Oct. Vol. 28. No. 10. pp. 902–905. With 2 figs.

The interest of this case lies in the fact that none of the usual methods of diagnosing amoebic abscess was successful. There was known to be a large liver abscess present and this had extended through the diaphragm to the right lung. Examination of the liver pus, of the expectorated matter, of scrapings from the wall of the abscess cavity and of the stools failed to reveal the entamoeba. The patient died and again examination of the lung, the liver and the intestine was negative for the protozoon. The diaphragm was thickened and oedematous with an area of necrosis and ulceration and in sections of this the entamoebae were numerous. No history of exposure to infection nor of any previous dysenteric symptoms was obtainable. *H. H. S.*

BERETERVIDE (Juan José) & MASOCH (Tomas J.). Hepatitis amebiana congestiva a forma tumoral. [**Localized Congestive Amoebic Hepatitis.**]—*Arch. Argentinos Enferm. Aparato Digest. y Nutric.* Buenos Aires. 1935. Aug.–Sept. Vol. 10. No. 6. pp. 589–596.

The case is reported of a man of 32 years with signs of a swelling of the upper part of the left lobe of the liver and localized pain. The leucocytes in his blood were 14,000 per cmm. with 57 per cent. polymorphonuclear. The faeces showed *E. histolytica* in large numbers, although no history of dysentery was obtained. The condition improved with

rest but, after he had been 24 days in hospital, emetine was given and the swelling, stated to be as large as an orange, disappeared, together with the pain. *H. H. S.*

YENIKOMSHIAN (H. A.). Amoebic Hepatitis.—*Jl. Egyptian Med. Assoc.* 1935. Dec. Vol. 18. No. 12. pp. 783–791.

MARINO (S.). Ascesso amebico del fegato. Contributo clinico.—*Policlinico.* Sez. Prat. 1936. Mar. 9. Vol. 43. No. 10. pp. 434, 437–8, 441–4, 447–8. [15 refs.]

HUARD (P.), RENUCCI (N.) & HUYNH-TAN-DOI. Les abcès du foie non amibiens. [**Liver Abscesses other than Amoebic.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1935. Sept. Vol. 13. No. 7. pp. 849–873.

There is undoubtedly a tendency for medical men practising in the tropics and subtropics to regard hepatic abscess as a sequela of amoebic dysentery or as a form of amoebiasis to the exclusion of other causes, and to try the effects of emetine or some drug treatment before resorting to operative measures—a procedure justified in the first case, but disastrous in the second. Hence this article, though breaking no new ground, is worth noting, because cases are detailed in which mistake might easily be made and valuable time lost. Among these mention may be made of streptococcal abscess arising from infection of an old amoebic lesion, liver abscess as one of several occurring in a staphylococcal septicaemia, another due to ascariasis, one to *Pf. whitmori* as a complication of melioidosis, etc. The moral is, of course, that careful examination should be undertaken to determine the amoebic source of the abscess before deciding to postpone operation. *H. H. S.*

MEYER-MAY (J.) & HUARD (P.). Note sur l'étiologie des abcès du foie. [**On the Causation of Liver Abscess.**]—*Bull. Soc. Path. Exot.* 1936. Jan. 8. Vol. 29. No. 1. pp. 61–72.

This article has been written on an analysis of 150 cases of hepatic abscess seen at the surgical clinic of the Hanoi School of Medicine. Of the total 138 were males, 12 females ; 66 were in whites, 84 in natives, the latter including Tonkingese, Hindus and Koreans. Forty-three (28·6 per cent.) were definitely known to have had dysentery, 66 had not, and 41 were doubtful. The pus was examined for organisms and amoebae were found in 7 only ; among 70 faecal examinations entamoebae were seen in five. Amoebic origin seemed to be more frequent in those from certain districts, rarer in others, *e.g.*, Tonking. [This statement is based on previous statistics, when the diagnosis was made on purely clinical grounds.] Causes other than amoebic are reported in 27 cases [but " causes " is hardly justified, as from the text it appears that all that is meant is " organisms isolated," their aetiological rôle is not proved and in some at least is highly problematical]. Staphylococci were found in 5, streptococci in 4, "various cocci " in 5, *Bact. coli* in 4, enterococcus and pneumococcus each 3, *Pf. whitmori*, *Bact. dysenteriae* His, and fusiform bacilli each once.

The staphylococcal origin was certain in one case, as the liver abscess occurred as a complication of a severe furunculosis with septicaemia. [While the presence of cocci and intestinal organisms does not

prove these to be the cause of the abscess, neither does the failure to find entamoeba disprove the aetiological rôle of the latter.] *H. H. S.*

Panayotatou (Angélique). Sur un cas d'"amibiase intestinale et bronchique." [**Intestinal and Bronchial Amoebiasis.**]—*Rev. Méd. et Hyg. Trop.* 1935. Sept.–Oct. Vol. 27. No. 5. pp. 231–232.

A child of 2 years was seriously ill with amoebic dysentery and a persistent cough which prevented any rest at night. The stools numbered 30–35 in the 24 hours, contained blood and entamoebae and were accompanied with tenesmus. Emetine hydrochloride 0·03 gm. was given together with 0·1 gm. camphostyle solution. Amelioration was rapid ; the stools were only half as frequent next day and in a few days were reduced to 3 or 4 in the day and free from blood. The cough also cleared up after the third day. [There is no direct evidence that the cough was due to bronchial amoebae ; the reason for so regarding it is that it disappeared rapidly after injections of emetine, and that other cases of bronchitis, without any intestinal amoebiasis, when treated in the same way did not thus respond.] *H. H. S.*

Chauvin (Louis). Sequelles d'amibiase avec poussées congestives hépatiques, syndrome de colite spasmodique pneumopathie seconde. [**A Case of Amoebiasis with Sequelae.**]—*Tunisie Méd.* 1936. Jan. Vol. 30. No. 1. pp. 1–9.

The chief point worthy of note in this case is the scarcity of objective signs to account for persistent subjective symptoms and complaints. The patient was a Sergeant, a male army sick attendant, a Tunisian, who was admitted to hospital in Fez in 1928 suffering from amoebic dysentery. This was followed later in the year by symptoms of appendicitis and appendicectomy was performed. In the summer of 1929 he had a relapse of his dysentery with much pain in the right iliac fossa ; a second laparotomy was performed but nothing discovered to account for the symptoms. In the spring of 1930 he again relapsed with dysentery, and had pain in the hepatic area and in the right shoulder. The blood showed a little anaemia ; red cells 3,990,000, white 9,300 per cmm. Improvement of symptoms followed administration of emetine for 5 days, then stovarsol and [for some reason not mentioned, as the infection was amoebic] dysentery bacteriophage. Soon after, shoulder pain and pain on breathing were marked, and there was a subicteric tint of the conjunctivae ; he expectorated chocolate-coloured sputum. Physical signs in the thorax were a few fine crepitations beneath the right clavicle ; on the left side in front harsh inspiration, and behind slight V.F.+ and fine subscapular crepitations. Emetine was again given, this time intravenously, 4, 6, and 8 cgm., and stovarsol. Convalescence was thereafter rapid.

H. H. S.

Oguro (T.). Ueber einen Fall von im Verlauf der Amöbendysenterie beobachteter Tetanie. [**Tetany in Amoebic Dysentery.**]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1935. Nov. Vol. 34. No. 11 (368). [In Japanese pp. 1844–1849. German summary p. 1850.]

A woman of 36 years suffering from dysentery and whose condition was improving after administration of emetine and yatren developed

signs of tetany. Trousseau's Chvostek's, Erb's (increased electric irritability of motor nerves) signs, and Schlesinger's leg phenomenon were all present. The calcium content of the serum was 8·6 mgm. per cent., later increased to 10·9. In spite of all treatment the patient became weaker and died two weeks after the onset of the tetany. [This is of interest as possibly being an example of dysentery which might be followed by sprue had the patient lived, since the serum calcium was so reduced. Schlesinger's phenomenon is elicited by holding the patient's leg at the knee and flexing strongly at the hip ; in a short time an extensor spasm occurs at the knee with marked supination of the foot.] *H. H. S.*

Wilkinson (W.). **Chronic Amoebiasis and Chronic Appendicitis.**—*Brit. Med. Jl.* 1935. Sept. 7. pp. 452–453.

It is not an uncommon experience to meet with patients who complain after, sometimes a long time after, an appendicectomy that they suffer from abdominal discomfort, flatulence, biliousness, general malaise and pain more or less localized to the right iliac fossa, and who present a certain degree of pallor, a furred tongue, a thickened and tender colon and an enlarged liver. Examination of fresh stools from these patients, in the tropics, reveals in a considerable number *E. histolytica*. The importance of the freshness of the stools is well known to all workers in the tropics and is well exemplified in Kenya where 366 cases only had been recorded during ten years among Europeans and natives examined at the laboratory some distance away, but in 5 months at the European hospital alone 125 positive findings were recorded when stools were examined on the spot. Treatment on the usual lines for amoebiasis proved efficacious among those with amoebae in the stools, and the same treatment was adopted for negative cases presenting similar symptoms, and these also benefited. Two typical cases are reported in detail.

Treatment of chronic amoebiasis is disappointing because the amount of the drug needed to act on the parasite which may be deep in the tissues is usually more than the patient can tolerate with safety. Carbarsone is probably the best or its congener amibiarson. Again, in the tropics there is often a liability to re-infection, since in East Africa [and elsewhere] amoebiasis is far from uncommon among Africans, and cooks and houseboys may be cyst-passers. *H. H. S.*

Lombardo (Vito). L'appendicite in portatori di ameba. [**Appendicitis in Amoeba Passers.**]—*Riv. Sanitaria Siciliana.* 1935. Sept. 15. Vol. 23. No. 18. pp. 1383–4, 1387–8, 1391–2, 1395. French summary (6 lines).

The author has examined the appendices removed from 15 persons who were found at the time (*i.e.*, just before operation) to be passing *E. histolytica* in their stools. He took the appendix in each case immediately after the removal and examined the contents fresh and stained and also sections of the walls. Fourteen were completely negative ; in one preparation only of one of the patients he found motile forms of the Entamoeba. In another patient who was passing large numbers of them and whose appendix showed points of ulceration, he had great hopes of finding them, but found none. In no instance

was there any histological lesion attributable to the amoeba. He concludes that, in Catania at all events, appendicitis due to Entamoeba must be very rare. *H. H. S.*

Bonnin (H.). La colite amibienne. [**Amoebic Colitis.**]—*Gaz. hebd. Sci. Méd. de Bordeaux.* 1935. Sept. 1. Vol. 56. No. 35. pp. 546–553. [56 refs.]

A general review of the subject. The author divides the complications which are met with in intestinal amoebiasis into five groups; infective, toxic, parasitic (*i.e.*, concomitant presence of other protozoa such as *E. coli* and *Giardia lamblia* and also *Blastocystis hominis*), dystrophic (ulceration, cicatrization) and nervous and functional (dyspepsia, meteorism, abdominal pain, irregularity of bowel action, etc.). His clinical subdivision into latent amoebiasis (without symptoms), cases with constipation, with diarrhoea intermittent at intervals short or long, or almost constant, or less severe but chronic, is not very satisfying. *H. H. S.*

Carles (Jacques) & Bonnin (H.). Les colites amibiennes et post-dysentériques. [**Colitis, Amoebic and Post-dysenteric.**]—*Jl. Méd. de Bordeaux.* 1935. Nov. 20. Vol. 112. No. 30. pp. 831–834.

A congress paper on general lines, chiefly from the clinical aspect. The authors divide the symptoms into four main groups: infective, often due to growth of secondary bacteria; toxic, from digestive disturbances and bacterial development; dystrophic and nervous, "entero-neuroses," and functional. The condition may be latent, producing practically no symptoms, or associated with constipation or diarrhoea or these alternating, and the diarrhoea may be intermittent, or chronic with abdominal pain situated anywhere along the colon or caecal region. The article is a fair summary of knowledge but introduces no new facts. *H. H. S.*

Trowell (H. C.). Loose Stools with Particular Reference to Amoebiasis. —*East African Med. Jl.* 1935. Nov. & Dec. Vol. 12. Nos. 8 & 9. pp. 229–234; 282–291; & 1936. Jan. No. 10. pp. 299–310. [25 refs.]

Mosto (Domingo). Tres casos de perforación intestinal por amebiasis. [**Amoebiasis with Perforation of the Intestine.**]—*Arch. Argentinos Enferm. Aparato Digest. y Nutric.* Buenos Aires. 1935. Aug.–Sept. Vol. 10. No. 6. pp. 541–562. With 16 figs.

Three cases are described, as regards history and post-mortem findings. The first was a man of 40 years who died at the time of admission while he was being examined. There is no statement as to the length of illness. Perforation was situated in the transverse colon; there was also an abscess in the right lobe of the liver. The second patient was a girl of 17 years who had been ill with vague symptoms—praecordial pain, palpitation, later oedema of legs, troublesome cough and loss of weight—for some 6–7 months, but a fortnight before admission suffered with intense pain in the left hypochondrium. Post-mortem revealed perforation at the base of the appendix and an ulcerative endocarditis. The third was a man of 40 who had suffered with dysenteric symptoms for some 15 years, more severely during the last

3 years. At autopsy he showed dysenteric ulceration of the caecum and colon, perforation in the descending colon and an amoebic abscess of the spleen. The article contains good photomicrographs.

H. H. S.

MAJUMDER (A. R.). **Atypical Manifestation of Amoebiasis.**—Reprinted from *Med. College Magazine.* 1935. Dec. Vol. 9. No. 2. 6 pp.

This article, though the fact is not stated, would appear to partake of the characters of a clinical lecture. A better title, in the opinion of the reviewer, would be " non-dysenteric manifestations and sequelae of amoebiasis." Attacks of dyspepsia, of sudden haemorrhage by the bowel, symptoms of appendicitis, even perforation may occur in patients in whom the amoebic infection was not suspected or had been forgotten. Hepatitis and pulmonary abscess are so well recognized as complications or sequelae that they are hardly to be classed now as atypical manifestations. The author writes " cerebral and splenic abscesses and also pyelitis, cystitis and epididymitis are caused by amoebic embolism," but no references are given in support of this. Again, is it quite correct to class " bacterial leak . . . sometimes responsible for subacute arthritis, synovitis, myositis and perineuritis " and cases of epidemic dropsy whose stools show amoebic cysts, or " leucoderma . . . associated with chronic amoebiasis " as constitutional effects of chronic amoebiasis or as atypical manifestations of amoebiasis ? Arthritis, neuritis and some other complications mentioned are more common in bacillary than amoebic dysentery and may be due to the double infection as well as to a leak of *Streptococcus viridans* viâ intestinal lesions caused by *E. histolytica.* The author regards the anaemia of pregnancy as due to " deficiency of the red cell maturing anti-anaemic principle and one factor at least is chronic amoebiasis."

H. H. S.

REED (Alfred C.) & ANDERSON (Hamilton H.). **Amebiasis and Cancer of Colon.**—*Amer. Jl. Med. Sci.* 1936. Feb. Vol. 191. No. 2. pp. 237–250. With 8 figs. (4 on 2 plates). [10 refs.]

An interesting account of four patients, one man and three women, of ages ranging between 40 and 49 years, in whom carcinoma developed upon amoebic infection of the colon. The duration of the amoebiasis was from 3 to 10 years; two had had no previous treatment for the amoebiasis, the condition having been undiagnosed; one had had intensive early treatment, the other late, with emetine. The authors urge that in view of this possible malignant development X-ray examination and barium enema should be carried out in all cases of recurring amoebic dysentery. There are two ways, possibly more, in which amoebiasis may be succeeded by carcinoma: irritation and reaction (not that there is not some subsidiary factor, see below); growth, polypoid and adenomatous, being set up, these being tumours which readily become malignant.

They postulate several possibilities as regards these predisposing, concomitant or subsidiary factors, which call for further study.

" Is there some predisposing factor which facilitates the development of chronic ulcerative colitis and cancer, as a sequel and complication of amebiasis ? Do vitamin G and the intrinsic gastric hormone play a part

in this predisposition ? Is there a relationship here to the frequently noted importance of high vitamin diet in the treatment of amebiasis ? Does the course of the disease and the eventual occurrence of malignancy, or the obscure chronic increasing lesions of amebiasis depend on or have relation to, deficiency of vitamin G, or vitamin B ? Do these same factors have any bearing on the sequential relation of cancer to amebiasis ? ''

H. H. S.

McMullin (J. J. A.). Amebiasis and its Surgical Complications.—*U.S. Nav. Med. Bull.* 1935. July. Vol. 33. No. 3. pp. 313–324.

Castellani (Aldo). **Three Clinical Signs useful in the Diagnosis of Chronic Amoebic Colitis.**—*Jl. Trop. Med. & Hyg.* 1935. Nov. 1. Vol. 38. No. 21. pp. 267–268.

The classical symptoms of chronic amoebic colitis—diarrhoea with blood and mucus—are often absent, and the entamoeba may be looked for day after day in vain. The author mentions a case where no amoebae or cysts or Charcot Leyden crystals were seen in 89 consecutive daily examinations, but positive results were obtained on the 90th day. He mentions three clinical physical signs due to affection of the liver in latent or very mild amoebic colitis, though hepatitis, fever and leucocytosis are absent. The first two signs are elicited with the patient recumbent. (1) Percussion from the umbilicus to the ensiform cartilage results in production of pain when the percussion reaches immediately below the ensiform cartilage. Pressure will elicit the same sign. The pain of duodenal ulcer or hyperchlorhydria is usually lower along this line, while that due to cholecystitis is to the right of it. (2) The midaxillary line is marked with a pencil ; from a point 4 cm. below the nipple a line is drawn horizontally to meet the former line at a right angle. The sign is dulness to firm percussion at the spot where these two lines meet and for a short distance outside it. (3) With the patient sitting up in bed a band of dulness is present at the right base and tactile fremitus there *may* be increased. This is ascribed to an enlarged liver thrusting up the diaphragm and giving the signs of partial consolidation of the lung adjacent.

The author states that in his experience the first sign is present in some 15 per cent. of such cases of amoebic colitis with little or no other indication ; the second in 20 per cent. and the third in 10 per cent. The combination of two is very suggestive and three almost diagnostic.

H. H. S.

Trabaud (J.). Les aspects médicaux de l'amibiase en Syrie. [**Amoebiasis in Syria : its Medical Aspects.**]—*Jl. Egyptian Med. Assoc.* 1935. Sept. Vol. 18. No. 9. pp. 579–589. [26 refs.]

Malaria, trachoma, Aleppo boil, three-day fever and amoebiasis are the chief diseases of Syria, says Professor Trabaud, but, if we take into account latent manifestations, the greatest of these is amoebiasis. Few escape infection, whether Europeans or natives, because vegetables are contaminated and the dust of the road contains the cysts in dried faecal deposits. The baby at the breast is infected from the soiled hands of the mother. The author than relates anomalous symptoms associated with the presence of amoebae or cysts in the stools, clearing up on treatment with emetine, stovarsol, etc. Apart

from clinical dysentery and liver pain due perhaps to amoebic cholecystitis, he mentions pulmonary or liver abscess, cystitis, pyelonephritis, meningitis, mental disturbance, anxieties, phobias and so forth. [It seems a slight misuse of terms to classify these as latent forms of amoebiasis.] *H. H. S.*

Waldorp (Carlos P.). Amebiasis y anemias graves. Consideraciones sobre la anemia "perniciosiforme" en la amebiasis.—*Prensa Méd. Argentina.* 1935. Nov. 13. Vol. 22. No. 46. pp. 2215–2222. With 2 figs. [16 refs.]

Brown (Philip W.). **Results and Dangers in the Treatment of Amebiasis. A Summary of Fifteen Years' Clinical Experience at the Mayo Clinic.**—*Jl. Amer. Med. Assoc.* 1935. Oct. 26. Vol. 105. No. 17. pp. 1319–1325. [18 refs.]

This is an instructive summary of a fairly wide experience in the treatment of amoebiasis. The article is divided into three sections, apart from some introductory remarks. The first considers the drugs commonly used in this condition, *viz.*, emetine hydrochloride, treparsol, acetarsone, arsphenamine, chiniofon (yatren), ipecacuanha, bismuth emetine iodide, vioform, and carbarsone, but except with the first three the number of patients treated was too small for valid inference. Emetine hydrochloride was given to 554 patients, and ill effects shown in some were peripheral neuritis, palsy and cardiovascular disturbances, rapid pulse, asthenia, vomiting and diarrhoea. Eight presented these symptoms in a fairly marked degree and another eight in mild form. Acetarsone (stovarsol) was used in 232 cases without a death (though others have recorded fatalities from its use); 13 suffered from severe toxic erythema, some so severe as to amount to dermatitis exfoliativa; one patient had serious peripheral neuritis which did not clear for nearly a year. Three hundred and one were given treparsol; 8 showed a toxic erythema, four at the end of the first course of 3–3·75 gm., four during or at the end of the second course of 3 gm.; the symptoms subsided in 3–5 days. Yatren was used in 37 cases only and vioform in 18.

The second section deals with the results of treatment. On this there is not much to say here for "cure" is "used to imply that not less than two examinations of stools were made on successive days following completion of treatment" though it is stated that "in most cases repeated examinations were made over a period of months to several years." [The results would have been more informative if only those were regarded as cured in whose faeces the amoeba could not be found in repeated examinations after a purge, during a period of six months or so.] Better results were obtained with arsenicals and the combined treatment of emetine and arsenical was found to succeed in patients who had resisted either singly. In fact, emetine has come to be regarded as suited to control the acute symptoms only. "Varying the ammunition immunizes reactions to the drugs," states the author, "and seems more effective in finally obtaining a cure . . . the barrage of arsphenamine, emetine, bismuth emetine iodide, chiniofon, carbarsone, acetarsone, treparsol, vioform and ipecac. is indeed startling, and one asks what good any one drug is when such a variety is used." In many, however, a cure was finally obtained even to very resistant infections.

Finally, the author briefly states the present methods of treatment which he employs.

"If the patient has not received antiamebic treatment recently, he is given 0·065 gm. (1 grain) of Burroughs, Wellcome & Co. emetine hydrochloride, subcutaneously, twice daily for three days. After an interval of a week, 0·043 gm. (two-thirds grain) of emetine is given twice daily for three more days. With the institution of the emetine, treparsol, 0·25 gm. (4 grains), is administered orally with each meal for four days. If there is no intolerance to arsenic, two more such courses are prescribed with intervals of ten days between the courses."

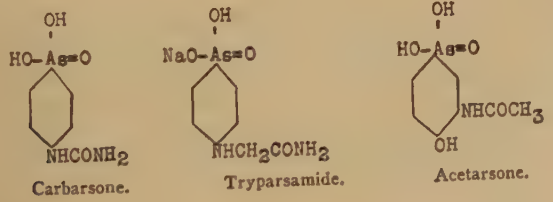
"If stool tests are positive following this regimen, three courses of chiniofon are prescribed: 3 gm. orally per day for a week and repeated for two more such courses, with a week's interval between courses. If diarrhoea is increased, the daily dose is decreased, thereby prolonging each course. Failure after this would indicate a course of one injection of arsphenamine weekly for six weeks, and 1 drachm (3·88 gm.) of bismuth subnitrate from three to six times daily during the period."

H. H. S.

EPSTEIN (Ervin). **Toxicity of Carbarsone. Acute Fatty Degeneration of the Liver, Exfoliative Dermatitis and Death following its Administration.**—*Jl. Amer. Med. Assoc.* 1936. Mar. 7. Vol. 106. No. 10. pp. 769–772.

In view of the fact that carbarsone is used in the treatment of amoebiasis and is generally thought to be comparatively innocuous, at all events in the doses usually employed, this record is of considerable importance.

Carbarsone or P-carbaminophenylarsonic acid ($H_2O_3AsC_6H_4NHCONH_2$) contains 28·8 per cent. arsenic acid and is supplied in capsules containing 0·25 gm. Seeing that it is closely allied to tryparsamide and acetarsone (stovarsol) (see formulae), it is surprisingly non-toxic.



Carbarsone. Tryparsamide. Acetarsone.

The case recorded is the first fatal case which the author has been able to find recorded. A woman of 55 years suffered from anorexia and diarrhoea (8–10 motions daily) for several months and in spite of varied treatments obtained no relief. The stools revealed Giardia in large numbers, but no other abnormality. Her last treatment before coming to hospital was carbarsone of which she took 5 gm. in 10 days; 2·5 gm. was given in enemas but these were not retained. She received altogether 83·3 mgm. per kilogram body weight. On admission the mucosae were pale, the skin dry, erythematous and covered, especially the legs, with a scaly eruption; the hair was dry, grey and lustreless. There was considerable anaemia: r.b.c. 2,640,000, Hb 46 per cent. (Sahli), leucocytes 5,650 per cmm. She progressed to a certain degree

for 10 days under treatment, which included a transfusion of 500 cc. citrated blood. After that she became worse, the diarrhoea continued (4 actions daily), jaundice supervened, the liver enlarged and death occurred 15 days after admission. The chief finding at autopsy was an enlarged, smooth, yellow, fatty liver, containing 65 per cent. fat by weight and 0·03 mgm. of arsenic per 100 gm. tissue. The kidneys showed some tubular necrosis.

Previous writers have recorded a dosage of carbarsone ranging to 2,100 mgm. per kilogram over a period of 15 months ; others to 1,200 mgm. over 48 weeks, so this patient with a total of 83·3 mgm. apparently died after a therapeutic dosage which is recommended to be given 5 gm. over a 10-day period. Experiments in the laboratory animals—guinea-pigs, rabbits, and cats—show the minimum lethal doses to be 150, 200 and 200–250 mgm. per kilo respectively, and when death occurs they show tubular necrosis of the kidney, as did the patient above. This drug is, therefore, not free from risk in therapeutic doses and if there is any doubt it would be well to make the usual tests for liver function since damage to this organ must be regarded as a contraindication to its administration [see this *Bulletin*, 1934, Vol. 31, p. 282]. *H. H. S.*

El-Biblawi (A.). **The Treatment of the Different Forms of Dysentery and Other Intestinal Disorders.**—*Jl. Egyptian Med. Assoc.* 1936. Jan. Vol. 19. No. 1. pp. 39–44.

The author records a number of cases of colitis, dysenteric, catarrhal and muco-membranous, treated with entero-vioform, an oxyquinoline derivative. It has, he states, advantages over emetine in that it does not affect the vomiting centre nor the heart. He gives details of cases of chronic dysentery of 5–10 years, and mentions 15 cases of acute amoebic dysentery, and others with chronic catarrhal colitis, with tenesmus and passage of blood and mucus, all benefiting greatly and most being cured (up to the time of recording) after a course of entero-vioform.

In acute disease in adults he gives 3 tablets (each of 0·25 gm.) daily after food for ten consecutive days ; in chronic cases in addition to this he gives as an enema at bedtime 2 tablets in 250 cc. tepid water, after a wash out, the enema being, if possible, retained all night. After 12 days' treatment 5 days' rest is allowed, and then oral treatment only is given for another week. The dose for children is 0·01 to 0·02 gm. per kilo. daily for a week. [The composition of the drug is not mentioned.]

H. H. S.

Sayid (Ibrahim Abdel). **Auricular Fibrillation after Emetine Injection.**—*Lancet.* 1935. Sept. 7. p. 556.

Cardiac irregularity is well known as one of the toxic effects of emetine, but the author here puts on record two cases, a woman aged 40 and a man of 50 years, each suffering from amoebic dysentery, to whom he gave emetine hydrochloride subcutaneously. The woman had mitral regurgitation, a sequela of an attack of rheumatic fever, and to her was given 1/3 grain daily for 6 days ; the man's heart was apparently healthy, he had 1 grain daily for 6 days, repeated after a 10 days' interval. Both patients developed severe auricular fibrillation necessitating the administration of digitalis. *H. H. S.*

Rosen (Eli A.), Martin (R. R.) & David (Norman A.). **Cumulative Toxicity of Emetine Hydrochloride in Guinea Pigs.**—*Proc. Soc. Experim. Biol. & Med.* 1935. Nov. Vol. 33. No. 2. pp. 289–291.

This series of experiments was undertaken to determine whether the subcutaneous administration of small graded doses of emetine hydrochloride led to cumulative toxicity. Guineapigs were the experimental animals, and as LD_{50} has been shown to be approximately the same for many laboratory animals and 20 mgm. per kilo the LD_{50} for white rats, this was chosen for the present study. Seventy animals were injected, ten having saline only, to serve as controls. The following table gives the results :—

Cumulative Toxicity of Emetine Hydrochloride in Guinea Pigs.

No. of doses	Mg./Kg. per dose	Mortality Ratio. No. dying/No. used	Average time of death, days from first injection
1	20	6/20	6·7
2	10	5/10	22·4
5	4	5/10	20·4
10	2	4/10	17·8
20	1	5/10	32·4
20	saline	0/10	—

From this it appears that the drug has a cumulative toxicity when injected in doses as small as 1/20 MLD. With the reservation that deductions from small numbers are to be regarded as unsure, it may be noted that the toxicity from repeated divided doses was even greater than that following a single dose of equal total amount. By inference, repeated doses should be given cautiously to human subjects.

H. H. S.

Chopra (R. N.), Sen (B.) & Sen (G.). **Amibiarson in the Treatment of Chronic Intestinal Amoebiasis.**—*Indian Med. Gaz.* 1935. June. Vol. 70. No. 6. pp. 324–328.

The authors comment on the disappointing results obtained with most drugs in the treatment of chronic intestinal amoebiasis. Emetine is almost useless after the acute stage, for it is too toxic to permit of its being taken in amount sufficient to reach the parasites deeply seated in the tissues. Oxyquinoline derivatives such as yatren, chinoform, vioform, though reputed to be highly amoebicidal, often fail to cure ; rivanol and bismuth have failed, Kurchi bark is good, but properly matured and dried bark is necessary and alkaloids obtained from indifferent quality bark prove a failure. Stovarsol and treparsol are not very effective. Carbarsone, introduced by Lilly and Co. of Indianapolis, U.S.A., has proved very efficacious in the authors' hands [see this *Bulletin*, 1934, Vol. 31, p. 282]. It is less toxic than stovarsol, is a stronger amoebicide and its therapeutic index in about 8 times as great.

A new compound, amibiarson, has been prepared by the Bengal Chemical and Pharmaceutical Works, Calcutta, having a chemical composition very similar to carbarsone (4-carbamino phenyl arsenic

acid) and is administered in the same way, 0·25 gram in gelatine capsules twice a day *per os* for 10–15 consecutive days. The patients are on ordinary diet, and a saline purgative is taken with the amibiarson. Cure is recorded when six or more consecutive stools have been examined on different days and found negative as regards presence of *E. histolytica*.

Of 40 patients who received this treatment 25, or 62·5 per cent., were cured; in 10 (25 per cent.) the result was indeterminate and in 5 (12·5 per cent.) it failed. The "indeterminates" showed much general improvement, but left hospital before the usual six examinations had been completed. The ratio of probable cures to failures was, therefore, 5 : 1; with carbarsone it was 5·7 : 1. *H. H. S.*

To (Sômei) & Kyu (Kenten). Sechs weitere Fälle von Amöbendysenterie mit Carpain behandelt. [**Six More Cases of Amoebic Dysentery treated with Carpain.**]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1935. Dec. Vol. 34. No. 12 (369). [In Japanese pp. 2063–2068. German summary p. 2069.]

In 1934 the authors treated a case of amoebic dysentery with carpain by way of experiment and obtained complete cure. They now record six more cases. Four were in the acute stages with fever, stools containing blood and mucus and showing amoebae. After 5–7 injections of carpain [the dose is not mentioned] the blood, mucus and amoebae disappeared and subjective symptoms cleared up. The other two had received treatment with emetine, but without success and the condition had become chronic. In these the carpain injections were followed by amelioration of symptoms and the amoebae in the stools were fewer, but cysts still were visible. The administration of yatren *per os* in addition to the carpain by injection brought about a cure with disappearance of the cysts.

Except for a local inflammatory reaction at the site of injection, which disappeared by the following day, no ill effects were observed in any of these six patients. The first patient treated with carpain had reacted strongly, with inflammation and oedema of the limb; this, in the authors' opinion, was due to the fact that the patient was a worker in metal and they think his occupation was in some way responsible.

H. H. S.

Castellani (Aldo). **The Treatment of Amoebic Colitis with Iodoform.**—*Jl. Trop. Med. & Hyg.* 1935. Nov. 1. Vol. 38. No. 21. pp. 268–269.

The author speaks highly of the results following the use of iodoform in subacute and chronic cases of amoebic colitis. The patient stays in bed and is given a very light or fluid diet, and after a purge of magnesium sulphate iodoform is given in keratinized capsules each containing 0·05 gm. ($\frac{3}{4}$ grain), one or two 3–4 times daily for 12–15 days. After an interval of a week the course may be repeated. The drug may also be given by enema 0·2–0·3 gm. in 300 cc. water. Nine cases are referred to and two are detailed. In one the amoebae disappeared on the 4th day and in the other on the 6th day after the treatment was started. Only one patient showed any toxic symptoms, and he complained merely of slight vertigo on the twelfth day. *H. H. S.*

Dyckerhoff (Hedwig). Ueber Leberschädigung durch Yatren. [**Damage to the Liver after Yatren.**]—*Muench. Med. Woch.* 1935. Nov. 8. Vol. 82. No. 45. pp. 1802–1803. With 1 fig.

Cases of injury to the liver have been reported as following intravenous administration of yatren. The lesions found bear a strong resemblance to those of subacute yellow atrophy as seen in arsenic and chloroform poisoning. The author carried out experiments with rabbits using a 5 per cent. solution of yatren. In normal animals very little change was set up in spite of the doses being higher correspondingly than is used in man. If, however, by dietetic means the glycogen content of the liver is reduced, then doses previously innocuous set up the condition described. Under certain circumstances, therefore, intravenous injection of yatren can lead to serious disturbance of the liver and it is incumbent upon us to forestall this by careful preliminary examination and determination of the bilirubin content of the blood. *H. H. S.*

Faust (Ernest Carroll) & Swartzwelder (John Clyde). **Use of Liver Extract Intramuscularly in the Course of Acute Amebiasis in Dogs.** —*Proc. Soc. Experim. Biol. & Med.* 1936. Jan. Vol. 33. No. 4. pp. 514–518.

The authors have previously recorded the effects of raw liver and powdered liver extract on *Entamoeba histolytica* in dogs experimentally infected, when the liver is administered *per os*. In the present article they give an account of the use of the extract when injected intramuscularly in dogs similarly infected. In 6 animals a commercial Parke, Davis & Co.'s product was used; in another 8 a fresh liver extract prepared by themselves. One cc. was equivalent to 5 gm. of fresh pig's liver. It was administered alternately into right and left gluteal regions in doses of 2 cc. The infecting protozoa were a human strain after passage through several dogs. In all of the experimentals (with one exception, a dog which had probably received an inadequate amount of the extract) the erythrocyte count was high and the Hb percentage fair, usually over 50 and in some 80, in spite of the loss of blood by the bowel. Other dogs not receiving liver showed decrease in r.b.cs. so the increase was not due merely to loss of fluid. In spite, however, of the blood changes the effect on the entamoeba was slight or nil when thus administered intramuscularly—markedly contrasting with the results of oral administration. It is concluded that "the fraction of raw liver which is efficacious as an amoebostatic agent is either different from that which prevents erythropoiesis, or that its amoebostatic action is inhibited when it is introduced intramuscularly." [See also this *Bulletin*, 1931, Vol. 28, p. 793; 1932, Vol. 29, p. 586; 1935, Vol. 32, pp. 191, 777.] *H. H. S.*

Massias (Charles). Hépatite amibienne suppurée, à propos de dix-neuf cas personnels, traitement émétinien, la question des abcès du foie non amibiens.—*Bull. Soc. Méd.-Chirurg. Indochine.* 1935. Dec. Vol. 13. No. 10. pp. 1625–1636. [35 refs.]

Huard (P.) & May (Meyer). Traitement des abcès du foie.—*Bull. Soc. Méd.-Chirurg. Indochine.* 1936. Jan. Vol. 14. No. 1. pp. 76–149.

Millischer. Considérations sur la thérapeutique médicale actuelle de l'amibiase.—*Jl. Egyptian Med. Assoc.* 1935. Aug. Vol. 18. No. 8. pp. 553–563.

HELMINTHIASIS.

Musgrave (J. A.). **Intestinal Worm Parasites in Relation to Public Health.**—*Med. Officer.* 1935. Dec. 14. Vol. 54. No. 24. pp. 245–247.

The dry system of conservancy is associated in Louth, Irish Free State, with high infections by ascaris and trichuris.

To direct smear of 242 faecal specimens, 60 showed ascaris eggs, 130 trichuris eggs and 151 both sorts. In streets with dry conservancy the percentage of infective children was 62. " Some 60 samples have been obtained to date from children who have been long domiciled in streets furnished with water flush closets and show a comparatively small percentage of worm infestations." [Surely a striking commentary on the confident dictum that practically any latrine if used will prevent ascaris infection.] *Clayton Lane.*

Vo Can Can (M.). L'helminthiase chez les enfants de la région provençale. [**Helminthiasis among Children in the South of France.**] —*Bull. Soc. Path. Exot.* 1935. Nov. 13. Vol. 28. No. 9. pp. 829–832.

The stools of 200 children in Marseilles hospitals were examined, and the findings reported.

The stools were examined macroscopically, by 2 smears measuring 50 by 22 mm., and by a Telemann-Langeron concentrative method.

One hundred and fifty of the children had never left the country ; their percentages of infection were : trichuris 73·33, ascaris 10, enterobius 3·33, *H. nana* 1·33, " *A. duodenale* " 0·66 ; 34 of them showed no ova.

Fifty children had been abroad and had these percentages of infection : trichuris 68, ascaris 30, enterobius 12, *H. nana* 6, " *A. duodenale* " 2 ; 10 showed no ova.

On 100 lettuces there were seen trichuris eggs 3 times and ascaris eggs 4 times. *C. L.*

Kalantarian (H. W.). Die Helminthosen der Bevölkerung von SSR Armenien und ihre Dynamik von 1924 bis 1933. [**Helminthiasis in Armenia.**]—*Arb. d. Tropeninstituts d. Volksgsndht. Kommissariat d. SSR. Armenien.* 1935. Vol. 2. [In Russian pp. 348–349. German summary pp. 376–377.]

The work has covered 10 years. The method of faecal examination is unstated. Hookworms and schistosomes are not endemic. Of 5,791 adults 96·3 per cent. are wormy, and of 4,604 children 90·6 per cent. Trichuris infection is present in 85·6 per cent. and seems to be getting larger, ascaris in 67·3 per cent. Trichostrongylus has lessened—in children from 14·2 to 0·5 per cent. *Taenia saginata* has risen from 11·9 to 27·5 per cent. in adults and from 5·7 to 8·6 per cent. in children. *H. nana* is increasing, in one school being as high as 26 per cent. Treatment puts infection with enterobius at 87 per cent. There were also seen *H. diminuta, D. caninum, E. granulosus, T. solium, S. stercoralis, F. hepatica* and *D. dendriticum.* *C. L.*

Foy (Henry) & Kondi (Athena). **A Note on a Faeces Survey in a Rural Greek Population of a Peloponnesian Village.** [Research Note.]—*Jl. Parasitology.* 1935. Dec. Vol. 21. No. 6. pp. 451–452.

"During the period of inter-regnum between two blackwater fever seasons a limited survey was made of the parasite content of the faeces of the inhabitants of a village on the southern shores of the Gulf of Corinth in the Peloponnesus. In all 200 specimens of faeces were examined. Two smears were made from each, one in normal saline, and the other in a solution of iodine in potassium iodide. The whole field under a 5×3 cm. cover slip was searched with the low power; anything suspicious was examined further by the high and dry, or the oil immersion. Concentration of the faeces by the method of Clayton Lane failed to reveal any hookworm eggs. The total parasite rate for the whole village was found to be 72 per cent. The infection rate among the males and females was not significantly different, being 76 per cent. among the females, and 68 per cent. among the males.

"Below are summarized the findings for the various parasites:—

"*E. histolytica* (cysts) 10 per cent.; *E. coli* (cysts) 13 per cent., *Lamblia* (cysts) 8 per cent., *Iodamoeba* (cysts) 6 per cent., Ascarids (eggs) 29 per cent., Trichurids (eggs) 42 per cent., Taenias (eggs) 2 per cent., Trematodes (eggs) 5 per cent., *Enterobius* (eggs) 1 per cent., *Hymenolepis* (eggs) 3 per cent., *Dipylidium* (eggs) 1 per cent., Non-classified 12 per cent.

"In the various age groups the infestation was distributed as follows:—

Age group	Males	Females
1 to 5 years	66 per cent.	66 per cent.
6 to 10 ,, ...	80 ,,	92 ,,
11 to 14 ,, ...	66 ,,	77 ,,
15 + ...	64 ,,	66 ,,

"Among those carrying parasites in their faeces there occurred the following distribution: double infections, 37 per cent.; triple infections, 12 per cent.; quadruple infections, 3 per cent.; quintuple infections, 1 per cent. The village had a spleen rate of 50 per cent. (Malaria) in 1933: kala-azar was prevalent, but the rate of infection was not known."

Basnuevo (Jose) & Anido (Vicente). La solución aceto-formo-azucarada en el enriquecimiento de huevos de parásitos en las heces fecales. [**Concentration Method for examining Faeces for Helminth Ova.**]—*Medicina de Hoy.* Habana. 1936. Mar. Vol. 1. No. 2. pp. 49–50. With 1 fig.

The authors employ the following solution: Acetic acid 100 cc., formol 100 cc., cane sugar 550 gm., water to a litre. The mixture is shaken thoroughly till the sugar is dissolved and then filtered. Their technique is to place 15 cc. of the fluid in a test-tube and add approximately 1 gm. of faeces, cork and shake vigorously for about 3 minutes, then pass through a fine sieve and collect the filtrate by means of a

funnel into a small 15 cc. glass receptacle [in the illustration this resembles a medicine glass in shape], fill to the top with the sugar-formol-acetic solution and leave for 30–40 minutes. Then place a coverslip in contact with the surface and transfer to a slide for examination. By this method Ankylostome, Trichuris and fecundated Ascaris are concentrated; unfertile Ascaris eggs rarely; Taenia and Hymenolepis are fairly well concentrated and also coccidia, but not *Fasciola hepatica*, nor protozoa. *H. H. S.*

Takasaki (J.). **Prevalence of Intestinal Parasites, particularly of Hookworms in Saitama Prefecture and its Prevention Work.**—*Jl. Public Health Assoc. Japan.* 1935. Oct. Vol. 11. No. 10. pp. 1–12.

The survey covers 874,680 persons examined during 13 years by "Yaoita's antiformin ether method" by the same staff. The percentages of infection were: totals 75·6, hookworm 34·7, roundworms 58·4, whipworms 23·1, trichostrongylus 1·4, threadworms 0·5, liver distomes 0·8, *H. nana* 0·02, *H. deminuta* 0·01; and a few had metagonimus. Cure rates after treatment are put as 46·6 after thymol [mention of any essential particulation being omitted], 50 after "nematol" and 69·4 after "parasitol." Repeated treatments at intervals of 1 to 3 years were followed by progressive lessening of infection, there being no mention at all of any accompanying sanitation. Infection did not produce any recognized loss of physique. *C. L.*

Calvó Fonseca (Rafael), Kourí (Pedro) & Basnuevo (José G.). Porcentaje y distribución geográfica del parasitismo intestinal en Cuba. [**Intestinal Parasitism in Havana.**]—*Vida Nueva.* 1935. Dec. 15. Vol. 36. No. 6. pp. 629–635.

The authors examined the faeces of 1,797 individuals in the town of Havana with a view to determining the prevalence of parasites, helminthic and protozoal. Of the total 655 or 36·4 per cent. were positive; 12·8 per cent. had protozoa only, 6·4 had helminth infestations also, and 17·3 worms only. There were 1,267 children and of these 479 or 37·8 per cent. harboured parasites; among the 530 adults 176 or 33·2 per cent. Of the helminthic infestations the commonest was Trichuris (19·2 per cent.), next Ascaris (6·9), Enterobius (1·4) and Necator (0·8 per cent. only). Of protozoa *E. coli* was seen in 12·2 per cent., *G. intestinalis* in 7·6, and *E. histolytica* in 1 per cent. There was practically no difference as regards sex; among the females 37·1 and among the males 36·6 per cent. were infected. The authors state: "The examination for protozoa was not thorough, the chief object being determination of helminths. We have not recorded *Chilomastix mesnili*, *E. nana*, *Trichomonas hominis*, which are fairly common in Cuba." [The authors also omit to give their method of examination, either for protozoa or helminths.] *H. H. S.*

Kouri (Pedro), Calvo Fonseca (Rafael) & Basnuevo (José G.). Porcentaje y distribución geográfica del parasitismo intestinal de Cuba. Provincia de la Habana. [**Intestinal Parasites in the Province of Havana, Cuba.**]—*Medicina de Hoy.* Habana. 1936. Mar. Vol. 1. No. 2. pp. 32–36.

The authors examined altogether 3,446 faecal specimens [method not stated], of which 1,797 were inhabitants of the town of Havana and the

remainder in 26 adjoining districts. They found 1,637 or 47·5 per cent. positive [the total is at variance with details given later]. Protozoa were not specially looked for but recorded when seen. *E. coli* was found in 508 or 14·7 per cent., *Giardia lamblia* in 208 or 6·0 per cent., and *E. histolytica* in 38 or 1·1 per cent.

Recording the findings by prevalence in sexes, it is stated that of 1,524 females 741 or 48·6 per cent. were passing ova or parasites and 596 or 45·2 per cent. of 1,318 males [this would give a total of 1,337 positive among 2,842 examined]. In their summary the authors state that protozoa alone were found in 303, protozoa and helminths in 204, worms only in 826. Trichuris was the most frequent, being present in nearly one-third of the total, Ascaris next 11·6 per cent., Necator 2·5, Enterobius 1·6. *H. H. S.*

Faust (Ernest Carroll) & Headlee (William Hugh). Intestinal Parasite Infections of the Ambulatory White Clinic Population of New Orleans. —*Amer. Jl. Trop. Med.* 1936. Jan. Vol. 16. No. 1. pp. 25–38. With 2 figs.

Ramsay (G. W. St. C.). **A Study on Schistosomiasis and Certain Other Helminthic Infections in Northern Nigeria.**—*West African Med. Jl.* 1934. Oct. Vol. 8. No. 2. pp. 2–10 and 1935. Jan. No. 3. pp. 2–7. With 4 graphs. [31 refs.]

The author's summary adequately states the results of his investigations :—

" 1. The advantages and limitations of the cutaneous test for bilharzial infection have been discussed. It has been concluded that the test cannot replace diligent examination of the excreta, but rather that both methods of diagnosis should be employed where possible.

" 2. The results obtained with the cutaneous test at different ages show that there is a rapid rise in the proportion of positive reactions until the age of about eleven years and that thereafter there is a slight but progressive fall.

" 3. It has been shown that vesical schistosomiasis has been diagnosed in nearly thirty-two per cent. of all cases, and that among children it was found in proportions varying from sixteen to eighty-four per cent. Intestinal schistosomiasis was proved in fifteen per cent. of all cases, the incidence among children ranging from nine to thirty-nine per cent. It has also been shown that the cutaneous test for bilharzial infection was positive in sixty-seven per cent. of all cases with extremes ranging from thirty-five to eighty per cent. in different localities. Finally, it has been recorded that in certain places the mallams state that every boy at some time in early life suffers from gross haematuria. Together, these observations form a chain of evidence which inevitably implies the conclusion that schistosomiasis is rampant in Northern Nigeria, and in some places well-nigh universal. Vesical schistosomiasis is apparently the more prevalent form of the disease, but the intestinal form is also common—probably more common than our results have indicated.

" 4. Hookworm and tapeworm infestations are common. In a total of 550 cases examined by the D.C.F. technique eighty-nine per cent. were found to be excreting hookworm eggs. *Necator americanus* and *Taenia saginata* are the prevailing species of these parasites.

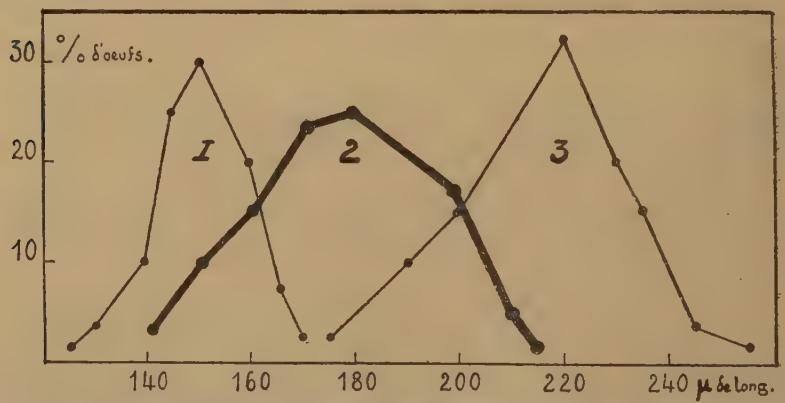
" 5. It has been emphasised that although the native seldom complains of symptoms due to his helminthic parasites (apart from guinea-worm) there is no justification for regarding them as harmless commensals because their presence must of necessity be a constant drain on the reserves of the host.

"6. The influence of the age of the host on the excretion of eggs of *B. haematobia*, *B. mansoni*, and *H. nana* has been studied. It has been shown that during the first few years of life there is a rapid rise in the proportion of persons excreting ova followed by a fall which takes place at first rapidly and then more slowly as age advances. Evidence has been offered in support of the view that this fall operates in accordance with some natural law and that it may perhaps be associated (at least in part) with the density of the parasite population within the host.

"7. *Planorbis pfeifferi* has been proved to be a natural intermediate host of *B. mansoni*; *Physopsis globosa*, *Bulinus tchadiensis*, and perhaps *Bulinus angolensis* being the intermediate hosts of *B. haematobia*." *C. L.*

VAN DEN BERGHE (L.). Sur le polymorphisme des oeufs de *Schistosoma haematobium* et la présence d'oeufs du type bovin dans les infections de l'homme au Katanga (Congo Belge). [**Polymorphism of Ova of** *Schistosoma haematobium*. **Ova in Human Infections in Katanga (Belgian Congo) resembling those of** *Sch. bovis*.]—*Bull. Soc. Path. Exot.* 1936. Jan. 8. Vol. 29. No. 1. pp. 41–46. With 2 figs.

When drawings and measurements were made of large numbers of the eggs of *S. haematobium*, van den Berghe found much difference in the sizes and shapes of eggs, a difference little evident when they were merely looked at under the microscope.



Curves showing the percentages of eggs in relation to their length: 1, in a normal urinary infection in man with *S. haematobium* alone; 2, in a "mixed" infection in man in which eggs of both *haematobium* and *mattheei* type were present; and 3, in a case of bovine schistosomiasis in an animal with *S. mattheei* alone.

[Reproduced from the *Bulletin de la Société de Pathologie Exotique*.]

The paper makes contacts with the work of BLACKIE [this *Bulletin*, 1932, Vol. 29. p. 401] in Southern Rhodesia, and of FISHER [this *Bulletin*, 1935, Vol. 32, p. 239] from the Katanga area itself which dealt with terminal spined eggs of a particular kind seen in human *faeces* to which FISHER gave the name *S. intercalatum*. But van den Berghe's report is that in the *urine* of man in Katanga a like condition was seen in 6 of 176 persons who had symptoms of urinary schistosomiasis, and he gives these overlapping curves (see Fig.), regarding which comparison should be made with those which were reproduced from FISHER's paper. Van den Berghe's own conclusion is that the 3 curves are indicative of an infection with polymorphic schistosomes, but that this can be settled only by infection experiments. *C. L.*

CALLOT (J.). Note sur la bilharziose dans le caidat des Nefzaoua (Tunisie). [**Schistosomiasis in Nefzaoua (Tunis).**]—*Ann. Parasit. Humaine et Comparée.* 1935. Nov. 1. Vol. 13. No. 6. pp. 533–536.

A note on the local distribution of *S. haematobium* and *B. contortus*.

C. L.

BROC & MAMI (A.). Schistosomiase intestinale. [**Intestinal Schistosomiasis.**]—*Tunisie Méd.* 1935. Dec. Vol. 29. No. 10. pp. 477–478.

Intestinal infection with *S. haematobium* which was possibly got at Matmata. In addition eggs and blood were present in the urine. *C. L.*

GIROLAMI (Mario). La profilassi della schistosomiasi nell'Africa Orientale. [**Prophylaxis of Schistosomiasis in East Africa.**]—*Arch. Ital. Sci. Med. Colon.* 1935. Dec. Vol. 16. No. 12. pp. 844–852. With 1 map.

The author brings evidence from the literature to show that schistosomiasis is widespread in Italian Somaliland. Though Bulinus is not recorded, Planorbis, Ampullaria and Blanfordia are abundant. The vesical form of schistosomiasis is believed to exist throughout Abyssinia, though to what degree is not known with any certainty. Indigenous cases have not been found in Eritrea. The usual lines of prophylaxis are recommended. Seeing that *Bulinus contortus* is present in Corsica and Sicily, the author warns the authorities to be on their guard against the introduction of the disease into Italy by returning troops.

H. H. S.

SATTA (Ernesto). Identificazione di un focolaio di bilharziosi intestinale nella colonia Eritrea. [**A Focus of Intestinal Schistosomiasis in Eritrea.**]—*Arch. Ital. Sci. Med. Colon.* 1935. Oct. Vol. 16. No. 10. pp. 760–762.

The patient here referred to paid a visit to Deddà Falls (torrente Deddà) down stream from Coazien and bathed in one of the pools. Soon after, he complained of intense itching which continued for 10 minutes, but for nearly 24 hours there was slight irritation of the inner parts of the thighs. Thirty-five days later he had an attack of diarrhoea, with passage of blood and mucus, 20 or more times in the day, with irregular fever and profuse sweating and headache. Ova of *Schistosoma mansoni* were present in the faeces and Planorbis was found in large numbers at Deddà from which 20 days after capture living cercariae were derived in the laboratory. *H. H. S.*

EGAN (C. H.). **An Outbreak of Schistosomiasis japonicum.**—*Jl. Roy. Nav. Med. Serv.* 1936. Jan. Vol. 22. No. 1. pp. 6–18.

An epidemic of Japonic schistosomiasis got by nearly half a ship's company from bathing in the Yangtse about 100 miles from its source.

So fixed in the lay mind is the idea that schistosomiasis in China is inevitably linked to shooting in paddy fields, that when H.M.S. *Sandpiper* was anchored at Chinkiang in 5 fathoms of water 3 cables from the nearest shore and from the mouth of a creek, and the weather was unusually hot, bathing from the ship was allowed. Though as just stated the ship was 600 yards from the nearest shore the concentration

of cercariae must have been great for 12 of the 18 who bathed became infected. Their case histories are given in detail. "Subsequent investigation showed that the intermediate host is to be found in great abundance in the vicinity and also on the opposite bank." [This little acute epidemic got by bathing recalls the similar one of acute ankylostomiasis got by bathing in the sea at a point where a stream was discharging turbid flood water into it (ASHFORD, PAYNE & PAYNE, this *Bulletin*, 1934, Vol. 31, pp. 122 and 391).] *C. L.*

MAURITIUS, COLONY OF: ANNUAL REPORT ON THE MEDICAL AND HEALTH DEPARTMENT 1ST JANUARY TO 31ST DECEMBER 1934 [KIRK (J. Balfour), Director]. Appendix I. pp. 42–44.—**Bilharzia** [ADAMS (A. R. D.), Senior Pathologist.]

A further report [see this *Bulletin, ante*, p. 94] on *Bulinus* (*Pyrgophysa*) *forskali* as the mollusc host of *Schistosoma haematobium* in Mauritius.

"*B.* (*P*) *forskali* was the only snail of many species tested which exerted a definite attractive action on freshly-hatched miracidia. The miracidia were actually seen vigorously to attack specimens of this species of snail. Penetration was observed *in vivo* under experimental conditions. This was subsequently confirmed by fixation of snails after a short period of exposure to infestation, and section; when it was seen that enormous numbers of miracidia had gained entrance into their bodies. Developmental forms of the larval stages of the worms were readily found on dissection after about two weeks in every snail of this species exposed to infestation; none were recovered from snails of other species. After a period of three weeks characteristic sporocysts were found in the liver glands, containing bifid-tailed cercariae true to type. Within twenty-eight days from initial exposure to infestation every snail so exposed was found on dissection to contain sporocysts with characteristic cercariae in large numbers, and at the end of this period usually a large number of cercariae were being emitted naturally from the affected molluscs. No other type of furco-cercous cercaria has so far been found in any snails dissected at the laboratory, in spite of the fact that many hundreds have been dissected during the last ten years; "wild" *forskali* obtained from the canals which we utilise for our material have not so far been found naturally infested, although a specific search on a large scale for naturally-infected snails has not yet been undertaken in places where there is a greater possibility of their acquiring the infection naturally." *C. L.*

i. CORT (W. W.). **Studies on Schistosome Dermatitis. I. Present Status of the Subject.**—*Amer. Jl. Hyg.* 1936. Mar. Vol. 23. No. 2. pp. 349–371. [40 refs.]

ii. TALBOT (S. Benton). **Studies on Schistosome Dermatitis. II. Morphological and Life History Studies on Three Dermatitis-producing Schistosoma Cercariae,** *C. elvae* **Miller, 1923,** *C. stagnicolae* **n. sp., and** *C. physellae* **n. sp.**—*Ibid.* pp. 372–384. With 3 figs. on 1 plate. [13 refs.]

iii. CORT (W. W.) & TALBOT (S. Benton). **Studies on Schistosome Dermatitis. III. Observations on the Behavior of the Dermatitis-producing Schistosome Cercariae.**—*Ibid.* pp. 385–396. [16 refs.]

i. In essentials a historical survey.

ii. Scope seen from title.

iii. *Cercaria elvae* acts as does *C. ocellata* of Europe but swims more vigorously. *C. douthitti* escapes from its snail host at night (the other 3 forms do so in the early morning) and spends most of its free life

attached to the surface film. *C. elvae* swims vigorously and rests on that side of the container which is turned to the light with its tail hooked over its body and the furcae crossed. *C. physellae* rests commonly on the bottom with its tail and postacetabular parts almost at right angles to the surface on which it is resting and its furcae spread out. *C. stagnicolae* hangs unattached in the water on the lightest side of the bottle. *C. L.*

Lancet. 1935. Aug. 24. p. 451.—**Bather's Itch.**

With reference to bather's itch in America (this *Bulletin*, 1928, Vol. 25, p. 946 and 1930, Vol. 27, p. 459), cases of dermatitis were reported from bathers in Burt Lake, Michigan, but no snails were found on the beach; yet when helmets were put on and search made of deep water these were seen to be present at depths of 6 to 18 feet. Since there is no way of putting to death cercariae or molluscs in large bodies of water all that it was possible to do was the marking of their beds so that swimmers were able to keep away from them. *C. L.*

Samy (Mostafa). **Bilharzial Piles and Anal Fissure.**—*Jl. Egyptian Med. Assoc.* 1936. Feb. Vol. 19. No. 2. pp. 65–71. With 5 figs.

Unless the cause of these conditions is recognized and the specific drug treatment is set going there will be constant recurrence, and, to him who gives the cases surgical treatment, discredit.

The piles are irregular pale brownish masses of mucosa, harder than ordinary piles, nearly always there have been earlier symptoms of chronic proctitis and the mucus over them has in it schistosome eggs. Within them are enlarged veins perhaps with the eggs in their walls or lumen. They may be a very early sign of the infection and specific treatment at once may save the patient much trouble. The fissures start as bilharzial ulcers at the anal margin, and are clinically fissures with eggs to be seen in scrapings. *C. L.*

Bruxelles-Médical. 1936. Jan. 5. Vol. 16. No. 10. pp. 355–356. With 4 coloured figs. on 2 plates.—Conditions chirurgicales de la bilharziose.

Lovett-Campbell (A. C.). **Helminthiasis involving the Appendix.**—*West African Med. Jl.* 1935. Nov. Vol. 8. No. 4. p. 15.

Two patients had their appendices taken out for acute symptoms. In the first the only parasites seen in the stools were amoebic cysts and the appendix had schistosome ova, believed to be those of *S. haematobium*, in the submucosa. In the second the faeces showed hookworm eggs and those of *S. haematobium* and tapeworm onchospheres, the appendix only threadworms. *C. L.*

Rodriguez Molina (R.) & Pons (Juan A.). **Hematological Studies on *Schistosomiasis mansoni* in Puerto Rico.**—*Puerto Rico Jl. Public Health & Trop. Med.* 1936. Mar. Vol. 11. No. 3. pp. 369–400. [48 refs.] [Spanish version pp. 401–433.]

A study of the blood of 20 cases of Mansonian schistosomiasis before treatment.

There were 18 males and 2 females, aged from 8 to 45. One was in the toxaemic stage, the infection got while bathing ; he had hookworm eggs in the faeces (though none were seen by Stoll's technique) red corpuscles 5·46 millions, haemoglobin 83 per cent., eosinophils 59·5 per cent. (5,266 of 8,850). In the intestinal stage were 8 persons, with red cells 3·41 to 5·3 million per cmm., haemoglobin from 50 to 116 per cent. and eosinophils from 1 to 56. In the visceral stage were 11 persons, with red cells from 1·36 to 3·96 million, haemoglobin from 30 to 100 and eosinophils from 3 to 30·5 per cent. The other blood details may be seen in the Tables. Fouadin and iron are given as the treatment of choice in the intestinal stage, at which time the anaemia is probably one of long iron deficiency. In the last stage, with worm-caused cirrhosis, liver and iron are of value, but even if the worms are then killed the structural damage has been done. The anaemia now is perhaps caused by deficiency of iron or by the " specific antianaemic factor conditioned by chronic liver damage (cirrhosis) and not necessarily by gastric dysfunction." The spleen was taken out in 2 late cases with great clinical benefit, but the end effect of the operation has still to be seen. *C. L.*

WATARAI (Jiro). **Studies on the Skin Reaction caused by Schistosoma japonicum, cutaneously applied on the Animals.**—*Japanese Jl. Experim. Med.* 1936. Feb. 20. Vol. 14. No. 1. pp. 1–18. With 6 figs. on 1 plate. [16 refs.]

" (1) The dermatitis, so-called ' Kabure ' with unknown cause seen in the endemic districts of Schistosomiasis japonica is not caused by invasion of Schistosomian cercariae into the skin, but it is probably caused by cutaneous emigration of heterogenous helminth larvae, which are improper to the human being and other mammals.

" (2) The skin reaction caused by Schistosoma cercariae has a certain host-parasite specificity in white rats, but not in domestic fowls." *C. L.*

CAWSTON (F. Gordon). **Recent Research in the Treatment of Bilharzia Disease.**—*Jl. Trop. Med. & Hyg.* 1936. Feb. 1. Vol. 39. No. 3. pp. 28–29.

" Bilharzia disease exists to a greater extent among the natives, poor Europeans and the coloured community than among the well-to-do settlers. It is specially pronounced in certain well-defined areas which have been recorded by the medical inspectors of schools, and in these localities *Physopsis africana* Krauss is the usual host.

" Treatment with tartar emetic skilfully applied has been the remedy of choice. Because of its inferior antimony content fouadin cannot be recommended except where intravenous injections are impossible and where treatment can be repeated if found necessary.

" The oxyquinoline derivatives are of great assistance in curing schistosomiasis, in view of their producing far less irritation to the subcutaneous structures and their promise of effecting an early cure of the disease. An extensive investigation is indicated to show how best these newer compounds may be applied to districts where a large proportion of the inhabitants are unable to afford the usual cost of prolonged treatment." *C. L.*

CAWSTON (F. Gordon). **Recent Advances in Schistosomiasis.**—*South African Med. Jl.* 1936. Feb. 8. Vol. 10. No. 3. p. 93.

Carbon tetrachloride causes degeneration of schistosome eggs, and in Egypt is often given before fouadin, whose real value is thereby made to seem greater than it is. The sodium tartar emetic is more toxic

than the potassium salt, the lithium salt less so and is deserving of use. Oxyquinoline derivatives of antimony are effective and little toxic.

C. L.

Montestruc (E.) & Bertrand (Ch.). La bilharziose intestinale à la Martinique et son traitement par l'anthiomaline (antimoniothiomalate de lithium). [**Treatment of Intestinal Schistosomiasis in Martinique by Anthiomaline.**]—*Rev. Méd. et Hyg. Trop.* 1936. Jan.–Feb. Vol. 28. No. 1. pp. 31–37.

Anthiomaline has been successful in infection with *S. mansoni* when tartar emetic and fouadin have failed or had to be abandoned on account of syncopal attacks.

Antimoniothiomalate of lithium was given intramuscularly every other day in successive doses (for adults) of 1, 2, 3 and 4 cc. (each cc. containing 0·06 gm.) to 29 persons; eggs disappeared in 1 case after 1 injection, in 10 cases after 2, in 10 after 3, in 3 after 4, and in 3 cases after 5 injections. In the 27 cases which could be examined later they were not seen again. The tolerance is described as striking. The infection is reported as giving locally so few symptoms that the people have no urge for treatment.

C. L.

Wager (Vincent A.). **The Possibility of eradicating Bilharzia by Extensive Planting of the Tree Balanites.**—*South African Med. Jl.* 1936. Jan. 11. Vol. 10. No. 1. pp. 10–11.

Balanites maughamii is deadly to snails and to cercariae.

This work extends that of Archibald [this *Bulletin*, 1934, Vol. 31, p. 114] on *B. aegyptiaca* and shows that the South African species of tree is as deadly as the Egyptian to *Limnaea natalensis*, *Physopsis africana*, tadpoles, cercariae, and fish of *Barbus* sp. up to 4 in. long, seeing that 1 pint in a litre of water kills in 10 minutes and that "dilutions of 1 in 100,000 cc. killed them in 24 hours."

"It is considered that in those areas where the tree grows naturally, or where it can become acclimatized, the extensive planting of *B. Maughamii* around ponds, vleis and dams and along streams, rivers and canals is a feasible and quite practical method of eradicating bilharzia. That this should be done or that it should become a national scheme cannot, however, in the writer's opinion, be advocated. For, unfortunately, commensurate with the eradication of snails, all fish and frogs would automatically disappear as well. The upsetting of the balance of nature by this wholesale destruction of the natural enemies of mosquitoes, flies, agricultural pests and noxious insects would, without doubt, have disastrous and far-reaching results. However, as snails also carry the cercaria of animal parasites such as liver-fluke, the tree could be planted with advantage around small dams used for watering cattle and sheep or for bathing purposes."

C. L.

Cawston (F. Gordon). **The Control of Bilharzia Infection in Swaziland.**—*Jl. Trop. Med. & Hyg.* 1935. Dec. 16. Vol. 38. No. 24. pp. 305–306.

Advice as to ridding the town of Bremersdorp of infection with *S. haematobium*.

It is pointed out that, in 1928, schistosomiasis of sheep was eradicated at Humansdorp, Cape Province, and that in Bremersdorp, where 1 in 3

of native children becomes infected, the same could be done there for man were the place inhabited by a docile human race. Practical advice is given and it is noted that already the association of infected pools with this disease is being impressed on the children there, and that a course of injections is a popular means of cure. *C. L.*

UTTLEY (K. H.). **On the Incidence of Clonorchiasis as met with in Post-Mortem Examinations in Kowloon, Hong Kong.**—*Chinese Med. Jl.* 1935. Nov. Vol. 49. No. 11. pp. 1267–1268.

In 367 consecutive autopsies (289 males and 78 females) on adult Chinese, clonorchis was present in 48 males of which 9 were heavy infections, and in 4 females of which 1 was heavy. In no case was the fluke deemed to be the cause of death. *C. L.*

KOMIYA (Yoshitaka), KAWANA (Hiroshi) & TAO (S. C.). **Study on *Clonorchis sinensis* in the District of Shanghai. I. Epidemiology of Human Clonorchiasis.**—Reprinted from *Jl. Shanghai Sci. Inst.* 1935. Oct. Sect. IV. Vol. 1. pp. 271–292. [43 refs.]

Faeces of 3,300 Japanese and 716 Chinese living in Shanghai in 1933 and 1934 were examined.

Examination was by a hydrochloric acid, antiformin ether method. The detailed figures are given. Incidence tends to rise with age in both nationalities and with the length of time spent in Shanghai, though among Chinese Cantonese are more heavily infected than others.

C. L.

BOLAÑOS (José M.), KOURÍ (Pedro), ANIDO (Vicente) & BASNUEVO (José G.). El parasitismo intestinal y la clonorchiasis en los chinos retenidos en Tiscornia. [**Intestinal Parasites in Chinese at the Detention Camp, Tiscornia, Cuba.**]—*Rev. Parasit., Clin. y Lab.* Habana. 1936. Jan.–Feb. Vol. 2. No. 1. pp. 39–49. With 3 figs.

In the course of 16 weeks, between July and November, 1935, the faeces of 200 Chinese immigrants were examined at the Detention Camp at Tiscornia, Havana, and 130 or 65 per cent. were found to be harbouring parasites in some form. Protozoa were few; only 4 had protozoa only, 14 had protozoa and helminths, and 112 had the latter only, *i.e.*, 9 per cent. had protozoa and 63 per cent. helminths. Of protozoa, *E. nana* was found in 10, *E. histolytica* and *E. coli* each in 3, and Iodamoeba, Giardia and Chilomastix once each. Helminthic infestations were: Ascaris 94 (47 per cent.), Clonorchis 45 (22·5), Trichuris 23 (11·5), Necator 17 (8·5), *Hymenolepis nana* once only. In 18, Ascaris and Clonorchis were both present; in 7 Ascaris and Trichuris, and Ascaris and Necator, these last three on 4 occasions, Clonorchis and Trichuris 3, these with Ascaris in 2. *H. H. S.*

KOURÍ (Pedro), BASNUEVO (José G.), ALVARÉ (Leopoldo) & LESCANO (Orlando). Clonorchiasis y cancer. [**Clonorchiasis and Cancer of the Liver.**]—*Rev. Parasit. Clin. y Lab.* Habana. 1936. Mar.–Apr. Vol. 2. No. 2. pp. 141–148. With 37 figs. on 33 plates.

Direct examination of the faeces of Chinese attending the Kow Kong clinic revealed nearly half to be harbouring Clonorchis, and more

recently of Chinese in Tiscornia [see above] 22·5 per cent. were passing the ova. The authors examined the livers of all Chinese coming to autopsy at the Havana mortuary, 17 in number and found 4 with Clonorchis. As regards pathological changes accompanying their presence, in one, although the flukes were many, no macroscopic alterations were observed ; in another, they were but slight—hypertrophy of the bile ducts. Two, however, showed carcinomatous lesions, and in one there seemed to be a causal connexion between the growth and the infestation, not in the other. The macroscopic and histological changes are described in the text and for the most part well depicted in the many photomicrographs appended to the article, but are not of great interest to the general reader. Those desirous of knowing more should consult the original. Suffice it to say that in the third case, flukes were many, the liver showed much sclerosis of the bile ducts and the interlobular connective tissue with marked cellular infiltration ; in the extra-hepatic ducts and in the gall-bladder were signs of inflammation and cirrhosis, and a primary cancer of the bile-ducts had been set up, due, state the authors, to the irritation caused by the presence of the worms and inflammation " due to the germs carried by them," in a liver already cirrhosed as a result of the infestation. In the other case cancerous changes were beginning, but no connexion was traceable between them and the presence of flukes. *H. H. S.*

i. Ide (Kiyoshi). **On a New Second Intermediate Host of** *Clonorchis sinensis*, **Wakasagi** (*Hypomedus olidus* (**Pallas**)).—*Kitasato Arch. Experim. Med.* 1936. Jan. Vol. 13. No. 1. pp. 40–44. With 1 fig. [13 refs.]

ii. ——. **Significance of** *Hemibarbus barbus* **(Temminck and Schlegel) as the Second Intermediate Host of** *Clonorchis sinensis*.—*Ibid.* pp. 45–47. With 1 fig.

i. This fish, one of the Salmonidae, is added to the list of larval hosts of *C. sinensis* all the others being Cyprinidae. It is a poor host, but being eaten raw is dangerous.

ii. This carp is another larval host and it also is eaten raw. *C. L.*

Yamaguti (Satyû). Ueber die Cercarie von *Clonorchis sinensis* (Cobbold). —*Ztschr. f. Parasitenk.* 1935. Dec. 13. Vol. 8. No. 2. pp. 183–187. With 4 figs.

Plotnikov (N.) & Zertchaninov (L.). [**" Fuadin-Konzentrat " in the Treatment of Opisthorchiasis.**]—*Med. Parasit. & Parasitic Dis.* Moscow. 1935. Vol. 4. No. 4. [In Russian pp. 299–301.]

The authors had previously reported the negative results of treatment of human opisthorchiasis with fouadin, which, however, proved to be efficient in feline infections. In the present paper they describe similar results obtained in the treatment of feline and human cases respectively with Bayer's " Fuadin-Konzentrat." *C. A. Hoare.*

de Jesus (Zacarias). *Lymnaea philippinensis*, an Intermediate Host of *Fasciola hepatica* in the Philippines, with Some Observations on the Bionomics of the Parasite.—*Philippine Jl. Sci.* 1935. Nov. Vol. 58. No. 3. pp. 299–315. With 8 figs. on 1 plate. [32 refs.]

i. AFRICA (Candido M.), DE LEON (Walfrido) & GARCIA (Eusebio Y.). **Heterophyidiasis : II. Ova in Sclerosed Mitral Valves with Other Chronic Lesions in the Myocardium.**—*Jl. Philippine Islands Med. Assoc.* 1935. Nov. Vol. 15. No. 11. pp. 583–592. With 23 figs. (8 coloured) on 12 plates.

ii. ——, —— & ——. **Heterophyidiasis : III. Ova associated with a Fatal Hemorrhage in the Right Basal Ganglia of the Brain.**—*Ibid.* 1936. Jan. Vol. 16. No. 1. pp. 22–26. With 4 figs. on 2 plates.

These papers are in fact continuations of that noted in this *Bulletin*, *ante*, p. 90, in which these flukes and their ova were seen to be the cause of heart failure. As to the new papers their titles give their range.

i. " A systematic study of three infested hearts with sclerosed mitral valves, involving several thousand paraffin sections made from 38 blocks carved from the different regions of the myocardium and valves, is reported in this paper. Different grades of lesion associated with eggs, varying from acute vascular changes in the form of hyperinjection of the blood vessels and marked edema, hemorrhages in the capillaries, and thrombosis secondary to embolism of eggs with fragmentation of the muscle fibers affected, to sclerosis of mitral valves with subsequent calcification leading to thickening and stiffening of the valvular leaflets have been found. Various fibrotic lesions of intermediate grades, such as circumscribed longitudinal or oval masses of closely packed endotheliocytes and histiocytes on a groundwork of young fibrous tissues of various ages, as well as well-formed fibrotic areas, have also been encountered in the different regions of the myocardium. It would seem that the eggs of these flukes are non-toxic or non-irritating, as the tissue reaction does not seem to be directed specifically against them. Reactions are evidently in the form of organization and repair to eliminate the substances spilled in their midst as a result of primary lesions such, for example, as hemorrhages, thrombosis, or embolism, caused by their presence in a mechanical way. It may be surmised, judging from the different ages of the lesions observed, that eggs arrive in the heart in successive sublethal crops in the course of the intestinal infestation by the adult flukes, during which time the valves and the myocardium receive insult after insult and hence become weakened until the heart is finally overwhelmed by a sudden massive terminal flooding of the cardiac vessels with these ova. It would thus seem, even at this stage of the investigation, that the conclusion is inescapable that the heterophyids considered in this work are associated with a definite disease with an apparently distinct and definite pathology, for which the name cardiac heterophyidiasis has been proposed. That this condition is relatively frequent in the Philippines is shown by the facts that new cases continue to come under our observation and that hearts with lesions associated with eggs have been found among old museum specimens. Further studies in the subject are in progress."

ii. " The occurrence of heterophyid eggs in the brain, as mentioned in our introduction, was predicted by us in our first paper (Africa, Garcia, and De Leon, 1935), and their possible presence in the spinal cord should be expected *a priori*, especially considering the fact that eggs of both *Schistosoma hematobium* and *S. mansoni* (which are three to six times larger than the eggs under consideration and, besides, possess cumbersome spines) have already been encountered in this portion of the cerebrospinal system. It must be recalled that the knee jerk was absent in a proportion of the cases of cardiac heterophyidiasis that came under our observation. After seeing the character of the lesions we encountered in the brain of the present case, we wonder if they could not be produced also by the same eggs in the spinal cord, thus accounting for the loss of function of this organ.

" Whether or not these eggs and the lesions we attribute to them in the brain of the present case are in any way related etiologically to the fatal

hemorrhage in the right basal ganglia cannot be decided on the basis of our present finding. The fact is certain, however, that heterophyid ova can be filtered in the brain from the general circulation and cause lesions in this organ that are exactly identical to those we found in the myocardium in our cases of cardiac heterophyidiasis. There is ample evidence that the mechanism of the production of these lesions in the brain is quite analogous to that which takes place in the heart; namely, plugging of capillaries and other vessels with eggs, rupture of these vessels, and the attempt at organization of spilled material in which proliferated endotheliocytes and histiocytes in a groundwork of fibrous tissue take a prominent part. These tissue reactions, which we observed associated with eggs in the wall of the large brain clot (which presumably killed the patient), are indications that capillary hemorrhages, obviously caused by the plugging of these vessels with eggs, had occurred some time prior to the fatal issue. Again, by looking at the character of these lesions, their presence in the brain substance in the immediate vicinity of an important or vital vessel (as seems to have occurred in this particular case) may tempt one to speculate on the possibility that this condition might cause increased peripheral resistance in a state of hypertension (as was true in this case) and bring about or precipitate the fatal hemorrhage. Furthermore, such lesions, which may lead sooner or later to degeneration and sclerosis, may possibly account for some cerebral conditions of unknown etiology—such, for example, as epilepsy, hemiplegia, aphasia, paresis, blindness, insanity, etc., depending on the extent and location of the lesion. At least, in further studies on heterophyid infestation of the cerebrospinal system these possibilities should not be overlooked." *C. L.*

Izumi (Matsunosuke). **Studies concerning a New Species of Metagonimus and its Life Cycle.**—*Kitasato Arch. Experim. Med.* 1935. Oct. Vol. 12. No. 4. pp. 362–384. With 5 figs. on 1 plate. [35 refs.]

The new species is named *Metagonimus katuradai*; details are given of its structure and life history.

It is about 2/3 of the size of *M. yokogawai*. The points in which it is thought to be different from other allied species are given. The host species harbouring the metacercaria are 3 freshwater fish named as "*Acheilognathus lanceolata* intermedie", *Pseudorasbora parva*, and *Zacco pletypus*. Infections have been caused in white rat, mouse, rabbit, dog, cat and man, and eggs were present in the faeces on the sixth day in man. *C. L.*

To (Sômei) & Ko (Bun). Erfahrungen in der Behandlung der Lungen-Distomiasis mit Carpain. [**Carpain in the Treatment of Paragonimiasis.**]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1935. Dec. Vol. 34. No. 12 (369). [In Japanese pp. 2070–2076. [12 refs.] German summary p. 2077.]

Subcutaneous injections with 5 per cent. carpain hydrochloride in normal saline cured two fresh cases of Paragonimiasis and improved two others who had already been treated with emetine hydrochloride. The total quantities of carpain injected were respectively 0·3 gm. over 6 days, 1·1 gm. over 23 days, 0·5 gm. over 10 days, and 0·9 gm. over 30 days. *C. L.*

UJIIE (N.). **On Structure and Development of *Echinochasmus japonicus* and its Parasitism in Man.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1936. Feb. Vol. 35. No. 2 (371). [In Japanese pp. 535–545. With 1 plate. [43 refs.] English summary pp. 545–546.]

Deliberate infection with *Echinochasmus japonicus* has been effected in two men.

First seen by TANABE in 1926 a new description in Japanese is given here of this fluke, with good figures. Its second intermediate host is *Pseudorasbora parva*—in the form of cysts on the gills. Its ordinary definitive host is dog or cat but mouse and rat and other mammals become so experimentally, and Ujiie infected himself and another volunteer. Eggs are seen in the faeces in man on the 7th or 8th day, the egg is oval, light yellow, operculum present but with no thickened rim, a protuberance at the other pole, and its mean size is 0·085 by 0·056 mm. The worms live in the lower half of the small intestine, causing some catarrh and are easily got rid of by carbon tetrachloride or ascaridole. *C. L.*

HOFF (Ferdinand) & SAUERSTEIN (Hans). Ueber Bothriocephalus-Anämie. [**Diphyllobothrium Anaemia.**]—*Klin. Woch.* 1936. Jan. 25. Vol. 15. No. 4. pp. 131–135. With 1 fig.

Bothriocephalus anaemia has an essential hereditary factor.

Of 270 cases of infection with *Diphyllobothrium latum*, 60 had an anaemia of the pernicious type and 26 a hypochromic condition such as is seen in secondary anaemia. It is not agreed that the pernicious type is somewhat rare by reason of the fact that the inhabitants unwittingly treat themselves by eating fish liver. This is a family disease and it is held that there is some hereditary constitutional peculiarity which brings it about. Those who harbour the worm without anaemia have nearly all normally acid gastric juice, and the fact that the two sorts of anaemia occur in members of the same family, and the observed passage of the pernicious into the chlorotic type during cure, is against any essential difference between the two forms. *C. L.*

OTTO (G. F.). **Human Infestation with the Dwarf Tapeworm, *Hymenolepis nana*, in Southern United States.** [Abstract.]—*Jl. Parasitology*. 1935. Dec. Vol. 21. No. 6. pp. 443–444.

" Human infestation with the dwarf tapeworm ranged from 0–9·3 per cent. in South Eastern United States. Outside the mountain areas the incidence averaged a fraction of a per cent. In the rural mountain population it was between 3 and 4 per cent. In the mining camps in the Kentucky Mountains it was between 9 and 10 per cent. The greatest infestation was in the 5–14 year age group (3·5 to 4·5 per cent. in the rural mountain population). In all other age groups in the same area the incidence was less than two per cent. In adults (over 20 years) and children less than 2 years the incidence is only a fraction of a per cent. Since the highest infestation is in the same area and age group with the highest ascaris infestation it suggests a similarity in acquisition of these infestations. The protozoa incidence is also exceptionally high in this area and the high incidence first appears in the same age group with the high ascaris and dwarf tapeworm infestation. It seems unnecessary then to invoke the rat as a disseminator of

the infection. The fact that the incidence with the dwarf tapeworm is so much lower than that of the other infestations mentioned may be attributed to the fact that the tapeworm eggs are less resistant to environmental conditions. Human infestation is probably for the most part acquired from contamination with fresh feces of human carriers."

Otto (G. F.). **Human Infestation with the Dwarf Tapeworm (*Hymenolepis nana*) in the Southern United States.**—*Amer. Jl. Hyg.* 1936. Jan. Vol. 23. No. 1. pp. 25–32. [24 refs.]

" The dwarf tapeworm in the United States occurs most commonly in school age children of the mountain districts of the southeastern part of the country, occurring up to 9–10 per cent. In all other areas and in other age groups the incidence is much lower, often being but a fraction of a per cent. Negroes have a somewhat lower incidence than whites. Human infection is probably acquired from an autochthonous strain by the ingestion of eggs from comparatively fresh feces."

Although it was the case that in decinormal NaOH solution partially dissolved eggs were seen, " it seems unlikely that the destruction of all of the eggs in a specimen occurred very often." This is the assumption which underlies the figures given, which were all obtained by the use of this diluting solution. *C. L.*

Hunninen (Arne V.). **An Experimental Study of Internal Autoinfection with *Hymenolepis fraterna* in White Mice.**—*Jl. Parasitology.* 1936. Feb. Vol. 22. No. 1. pp. 84–87. With 1 fig.

Mice were put into stocks of such a kind that they could not possibly eat their faeces, with these results.

" From the above experiments the suggestion can be made that internal autoinfection with *H. fraterna* does not occur in normal mice but may occur in mice whose resistance has been decreased by some factor as for example, by bacterial infection. Further, this experimental demonstration of the possibility of the occurrence of internal autoinfection under certain conditions in mice, make it seem very probable that it may occur under similar conditions with *H. nana* in man. *C. L.*

Coutelen (F.). Les oiseaux domestiques peuvent-ils héberger spontanément des hydatides échinococciques et prendre place dans le cycle évolutif normal du ténia échinocoque ? (Contrôle expérimental). [**Can Domestic Birds harbour Hydatids and take part in the Normal Developmental Cycle of *T. echinococcus* ?**]—*C. R. Soc. Biol.* 1936. Vol. 121. No. 6. pp. 490–493.

The answer to the question in the title is No.

Two fowls, 5 pigeons and 3 young turkeys were given about 400,000 scolices each into the peritoneal cavity, and showed no infection 25 days to 7½ months later. *C. L.*

Carrodus (Arthur L.). **Intrabiliary Rupture of Hydatid Cysts of the Liver : Report of Five Cases.**—*Med. Jl. Australia.* 1935. Nov. 23. 22nd Year. Vol. 2. No. 21. pp. 714–724. With 6 figs.

The account and discussion of these five cases is detailed and of marked surgical interest.

Important points for tropical medicine are the need for washing the stools in cases where there is doubt, an action which may bring to light a bile-stained gelatinous membrane in the pan ; a positive intradermal Casoni reaction in 90 per cent. of persons, the other ten per cent. having nearly all a positive complement deviation reaction ; while X-rays may show the outline of cysts. *C. L.*

Blanco (R. Piaggio), Capurro (F. Garcia) & Dévé (F.). Un cas humain d'échinococcose hépatique micropolykystique infiltrée, observé en Uruguay. [**A Case of Hydatid of Liver observed in Uruguay.**]—*Bull. Acad. Méd.* 1935. Dec. 3. 99th Year. 3rd Ser. Vol. 114. No. 39. pp. 520–523. With 1 fig.

The first case of alveolar hydatid reported from Uruguay. In spite of hepatic puncture during life its discovery was only made after death. *C. L.*

Cataliotti (F.). L'echinococco della tiroide. [**Hydatid of the Thyroid.**]—*Riv. Sanitaria Siciliana.* 1935. July 15. Vol. 23. No. 14. pp. 1064–1068, 1071–1072. With 1 fig. [12 refs.] French summary (5 lines).

Search of the literature has shown that hydatid cyst of the thyroid is a rare event, about 0·5 per cent. of such tumours having this situation and the condition is usually discovered at operation or autopsy. The present account is that of a woman of 28 years who stated that her neck had been getting larger for two years ; she first noticed a local swelling the size of a hazel-nut, but it was now that of a large orange. It was cystic and appeared to be divided into two by a sulcus. Operation was undertaken in the belief that the tumour was a cystic goitre, but except for firm adhesions at the base was found to be easily separated and proved to be a hydatid. *H. H. S.*

Turner (E. L.), Berberian (D. A.) & Dennis (E. W.). The Production of Artificial Immunity in Dogs against *Echinococcus granulosus*.—*Jl. Parasitology.* 1936. Feb. Vol. 22. No. 1. pp. 14–28. [23 refs.]

Penfold (W. J.), Penfold (H. Boyd) & Phillips (Mary). **A Survey of the Incidence of *Taenia saginata* Infestation in the Population of the State of Victoria from January, 1934, to July, 1935.**—*Med. Jl. Australia.* 1936. Feb. 29. 23rd Year. Vol. 1. No. 9. pp. 283–285.

Infection with *Taenia saginata* is relatively rare in Victoria, being seen mostly in Syrians infected before coming to Australia. A stronger quarantine policy and proper payment of those whose help is asked are advised. *C. L.*

Ch'eng (Y. L.) & K'ang (H. J.). *Cysticercosis cellulosae* **in Man. (Report of a Case with Very Severe Infestation, especially of the Brain.)**—*Chinese Med. Jl.* 1936. Feb. Vol. 50. No. 2. pp. 137–139. With 4 figs. on 2 plates.

A very heavy general infection with cysticerci.

The history was mainly of mental trouble. It began 4 years earlier with headache and loss of vision but no vomiting. Then the patient

began to see ghosts. There were attacks of unconsciousness before which there was marked increase in the headache. She came to hospital for opium poisoning and died in 10 hours. Figures illustrate the weight of the infection in brain and muscles. *C. L.*

Lipscomb (F. M.). **A Case of Cysticercosis** (*T. solium*).—*Jl. Roy. Army Med. Corps.* 1935. Dec. Vol. 65. No. 6. pp. 397–400. With 1 chart.

A case of cerebral cysticercosis which was probably under observation from infection to death and so is worthy of detailed note.

A private of 21, evidently in the Rawalpindi District, Punjab, India, was taken into hospital with fever and body pains suggesting enteric. Eosinophils on days 6, 7, 11 and 18 of the infection were 3, 7, 12 and 1 per cent.; there was severe occipital headache about day 10, soon disappearing; on day 11 a tapeworm segment passed, but the picture was so like enteric that no anthelmintic was given. Temperature from day 26 to day 34 was normal and tests for enteric and melitensis infections negative. A tapeworm onchosphere was seen on day 20. On day 35 filix mas brought away a complete *Taenia solium*. About day 70 he was discharged, about day 83 taken in again with weakness, headache and vomiting, about day 105 papilloedema with loss of sight in right eye, on day 113 this was worse with severe headache and vomiting, on day 123 a right subtemporal decompression improved things for the time, but hernia cerebri came on with fever and unconsciousness and he died on day 161. The hernia cerebri had caused abscess with local meningitis. There were 150 cysticerci scattered through the brain, none was found elsewhere. *C. L.*

MacArthur (W. P.). **Cysticercosis of the Brain.** [Correspondence.]—*Brit. Med. Jl.* 1935. Dec. 21. p. 1229.

British Medical Journal. 1935. Dec. 21. pp. 1214–1215.—**Cysticercosis and Epilepsy.**

Cysticercosis of the brain need be no matter of ready diagnosis.

Quiescence is essential for the parasite's survival, but when it dies it causes symptoms by swelling and by the freeing of toxins, or it may be detected by X-rays through the calcification which then comes about, though in the latter case this change cannot be expected till symptoms have lasted for about 3 years. *C. L.*

Dick (John C.). Cerebral Cysticercosis simulating Epilepsy. [Memoranda.]—*Brit. Med. Jl.* 1936. Feb. 22. p. 364.

Gögl (H.). Zystizerkose des Gehirns. [**Cerebral Cysticercosis.**]—*Wien. Klin. Woch.* 1935. Nov. 15. Vol. 48. No. 46. pp. 1417–1419. With 1 fig. [17 refs.]

Two cases with brain symptoms are described in which the exciting cause is put down as *Cysticercus racemosus*, described by Zeder in 1871, parasites which have no heads. Both of these were found about the optic chiasma. There were no cysticerci in other organs and no tapeworms in the intestine. *C. L.*

Morrison (W. K.). **Pig and Pork : Cysticercosis** (*Taenia solium*).—*Jl. Roy. Army Med. Corps.* 1936. Jan. Vol. 66. No. 1. pp. 32–35.

" (1) Infestation of pig in South India with cysticercosis (*T. solium*) is not uncommon.

" (2) Such an infestation may be from one or two parasites up to any number.

" (3) Practical inspection of pig flesh should be followed up by thorough cooking." *C. L.*

Trawiński (A.). Ueber Anwendung der Präzipitationsreaktion zum Nachweis der Schweinezystizerkose. [**The Precipitin Reaction in the Diagnosis of Cysticercosis in Pigs.**]—*Zent. f. Bakt.* I. Abt. Orig. 1936. Feb. 13. Vol. 136. No. 1/2. pp. 116–120.

A positive precipitin reaction for cysticercosis in pigs was given with an antigen made from *Cysticercus cellulosae*. The reaction is specific and is got with blood serum and muscle extract. *C. L.*

Larrousse (F.). Évolution du *Cysticercus fasciolaris* et injection d'extraits vermineux : réaction de type sarcomateux. [**Sarcoma-like Reaction to Injection of Worm Extracts.**]—*Ann. Parasit. Humaine et Comparée.* 1935. Nov. 1. Vol. 13. No. 6. pp. 528–532. With 2 figs. on 1 plate.

In 3 rats harbouring *C. fasciolaris* intraperitoneal injection of worm extracts has brought about a sarcomatous reaction, extract of *T. saginata* being used in 2 cases and of *F. hepatica* in one. *C. L.*

Maplestone (P. A.) & Riddle (J. S.). **Infection with** *Bertiella studeri*. —*Indian Med. Gaz.* 1936. Feb. Vol. 71. No. 2. p. 81.

A European boy of 5 in Fyzabad passed segments of a Bertiella, probably *B. studeri*, after being given magnesium sulphate for vomiting and colic. The two other Indian cases lived in Eastern Bengal. This is the tenth case from man, for Adams and Webb [this *Bulletin*, 1934, Vol. 31, p. 119] counted one twice ; it had been reported by Mukerji [this *Bulletin*, 1928, Vol. 25, p. 448] and merely recorded by Chandler. *C. L.*

REVIEWS AND NOTICES.

Orenstein (A. J.) [C.M.G., LL.D., M.D., etc., Chief Medical Officer] & Gordon (A.) [F.I.S.E., Chief Health Inspector]. **Notes on Elementary Hygiene, etc., for Compound Officials.**—68 pp. With 11 folding figs. 1936. Johannesburg: Central Mining—Rand Mines Group. Health Department. P.O. Box 1056. [Review appears also in *Bulletin of Hygiene*.]

The first issue of this book was made more than 5 years ago, and during the interval not only was the edition exhausted but also a reprint. The opportunity of a re-issue has been taken to review and revise the information. These notes were originally compiled to constitute a guide for compound officials in whose hands rests largely the prime responsibility of maintaining the health of the employed natives and to that end of seeing that no readily preventable violation of the canons of hygiene occurs. For this enlarged and revised edition the Chief Medical Officer, Dr. A. J. Orenstein, has co-opted the services of the Chief Health Inspector, Mr. A. Gordon. The mine officials are taking an ever-increasing interest in the sanitary state of the mines and the welfare of the native employees, stimulated doubtless by the efforts of the Chief Medical Officer, and the results of this interest have found expression in the lowered morbidity and mortality rates of late years.

The work follows the usual lines—general principles applied to local conditions. It is divided into eleven chapters. The first two briefly describing the body and its needs and the ways in which health may be maintained and disease result from their neglect. Then in succession are chapters on Housing, Waste-disposal, Disinfection (and these are supplemented by an appendix of illustrations of plans of houses, ablution rooms, latrines, refuse bins, destructors, disinfectors, etc.). Food (including ration scales, the constitution of the various foodstuffs and their vitamin content), kitchen methods and the need for cleanliness therein. Short chapters deal with rat proofing of buildings, the catching and poisoning of rats, the points to note when making inspection of a compound, or when choosing a site for a new compound. The terminal chapter gives a few hints to the layman on the early signs of disease among natives under his charge, so that the patient may receive treatment soon, and danger of spread of infection among his fellow-workers be minimized. Such a work should find a ready acceptance by a wider circle than that of mine officials; many of the points would apply equally in any African colony where natives are employed.

H. H. S.

Chandler (Asa C.) [M.S., Ph.D., Professor of Biology, Rice Inst., Houston, Texas, etc.] **Introduction to Human Parasitology.** Fifth Edition. Rewritten and Enlarged.—pp. xvi+661. With 308 figs. 1936. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Limited. [25*s*.]

It is now eighteen years since Professor Chandler first published his book on Animal Parasites and Human Disease [see this *Bulletin*, 1918, Vol. 12, p. 228] which was designed to set forth the important facts of human parasitology in a form sufficiently readable to appeal to a wider public than professional biologists and physicians. This wider object

failed, but instead the book has been extensively used as a textbook for introductory courses in parasitology both in academic and medical schools, therefore the work has been entirely rewritten and rearranged from this point of view. The result is a well balanced text-book on the subject, which, in the short space of little more than 600 pages, manages to include the main features in the life-cycles, epidemiological factors, and inter-relations of parasite and host in the case of the more important animal parasites affecting man, together with an account of the main principles of treatment and prevention.

The book is divided into three sections of approximately equal size dealing respectively with protozoa, helminths and arthropods. For convenience, spirochaetes, rickettsiae, and the filterable viruses transmitted by insect vectors are also included in the section on protozoa. The second part, dealing with helminths, is of especial interest as it includes, perhaps, some of the most important recent advances in our knowledge of human parasitology.

The third section opens with an eloquent peroration on the importance of arthropods as disease *carriers*, for relatively few are directly injurious, but the statement that " trench fever " " was the cause of more morbidity among the allied soldiers during the Great War than all other factors combined " is surely an exaggeration. Again this section gives an excellent introduction to the subject, but some of the figures, especially those drawn from photographs, are not in keeping with the general high standard of the book.

It is difficult in a work of this magnitude to avoid the inclusion of some slight slips such as Morisund for Moursund on p. 52 ; *Citillus* for *Citellus* on pp. 13, 199 and 507 ; but it would be ungracious to dwell on any of these minor flaws in an excellent piece of work, which can be thoroughly recommended to all students of the subject.

The author pays a grateful tribute to the assistance derived from the *Tropical Diseases Bulletin* and also from the *Review of Applied Entomology* and the *Journal of the American Medical Association* and remarks that the preparation of the book could not possibly have been completed without the help of these journals. *E. Hindle.*

Maciel (Heraldo) [Membro titular da Academia Nacional de Medicina, Docente livre de Medicina, Docente livre de Medicina Tropical e Doenças Infecciosas]. **Helminthos e helminthoses do homem, no Brasil.** [Helminths and Helminthiasis of Man in Brazil.]—404 pp. With 17 coloured graphs & 89 figs. (2 coloured). 1936. Rio de Janeiro : Imprensa Naval.

Though this book is largely of the nature of a compilation, the work has been carefully and conscientiously carried out and so becomes a mine of reliable information. It is divided into six main sections, apart from a brief introduction. The first, condensed into 4 pages, gives notes on the technique for a study of worms—their fixation, preservation and staining. The second, 120 pages, describes *seriatim* the various worms—nematodes, trematodes, cestodes and acanthocephala—which infect man in Brazil, giving in each case the synonyms with dates, their characters, habitat, evolution and developmental cycle, illustrated by line drawings mostly borrowed. Then follows another short section of 14 pages on laboratory methods used in diagnosis—search for ova, larvae, and adults in the faeces, urine, sputum and blood. Mention is made of *Sch. haematobium* and of *Paragonimus* though neither of these

occurs in Brazil. Stoll's, Clayton Lane's and Praguer Froes' methods of examination for ova are all described. The fourth section, 4 pages only, treats of serodiagnostic methods, complement deviation, flocculation (precipitin) and intradermal reactions. Fairley's technique for Schistosoma is spoken of under the first of these, but his name is not referred to under the last. The fifth and longest section, 140 pages, takes up the clinical aspect of Brazilian helminthiasis, each being dealt with under the headings of synonymy, aetiology, geographical distribution, the endemic index in Brazil, the symptomatology, pathogeny when important, diagnosis, prognosis and treatment, both curative and prophylactic. This part is well illustrated. The final section relates in more or less general terms, without much detail, the results of a ten years' anthelmintic campaign from 1920–29, as gauged by patients in the Marinha Central Hospital. Figures of incidence and of infestation by separate species of worm are presented in tables and there is a series of 17 graphs depicting the incidence by single species and by combinations of species. A bibliography of 22 pages is appended, but of Brazilian literature only, so that, though it shows what has been done in that country or by Brazilian authors, it is far from complete. There is a useful index. *H. H. S.*

MOLLARET (Pierre). **Le traitement de la fièvre jaune.** [Treatment of Yellow Fever.]—128 pp. (Collection Les Thérapeutiques Nouvelles.] 1936. Paris: J. B. Baillière et Fils. 19 rue Hautefeuille. [18*fr.*]

This small book forms one of a numerous series now being published in France under the title of " Les thérapeutiques nouvelles," designed to give in precise form the most recent advances in treatment. Unfortunately in yellow fever as in other virus diseases specific chemotherapeutic treatment is lacking and all that can be done is to attempt to alleviate the various dangerous symptoms that may arise. With this end in view the book begins with a brief outline of the main clinical features of the disease. General and symptomatic treatment is then fully discussed with special insistence on the value of sugar and of large quantities of fluid, which should be administered *per rectum* if gastric intolerance is so great as to prevent their being retained when given by mouth. An interesting account is given of the preparation of certain native remedies, derived from indigenous African plants, such as *Andropogon Schoenanthus* L. which certainly has a diaphoretic action and when boiled gives off an aromatic odour that drives off mosquitoes. The value of immune serum in treatment is also fully discussed.

The second part of the book deals with the prophylaxis of yellow fever—the measures to be taken to prevent mosquitoes biting persons attacked by the disease, aerial and maritime quarantine: an excellent account is also given of the present position of affairs in regard to immunization. There are one or two small errors: on page 99 Low becomes transformed into Carmichael. It is perhaps unduly pessimistic to state that " la nature du virus amaril demeure encore complément inconnue " for it can now be easily grown in tissue culture, its size is accurately known and its general properties conform to those of other viruses. There is no index but a full " table des matières " completes a very useful and instructive volume. *G. M. Findlay.*

HOPKINS (G. H. E.) [M.A., F.R.E.S., Entomologist, Department of Agriculture, Uganda.] **Mosquitoes of the Ethiopian Region. I.—Larval Bionomics of Mosquitoes and Taxonomy of Culicine Larvae.** —250 pp. With 158 figs. 1936. London: British Museum (Natural History).

We understand that the work will be completed in three volumes, of which the second (on Anopheline adults and early stages by Dr. A. M. Evans) and the third (on zoogeography and taxonomy of adult Culicines by Dr. F. W. Edwards) will appear in 1937. It is hoped to review the three volumes together at a later date. It must suffice for the moment to deal very briefly with Hopkins' contribution, which describes the ecology of mosquito larvae in Africa, and more particularly the larvae of the Culicines. A remarkable proportion of these have been described and figured. The present volume will prove of great value to those who require to identify Culicine larvae in relation to studies on yellow fever. *P. A. Buxton.*

SOCIEDAD ARGENTINA PATOLOGIA REGIONAL DEL NORTE. **Octava Reunión . . . celebrada en Santiago del Estero 2 y 3 de octubre de 1933.** [Proceedings of the Eighth Conference of the Pathological Society of Northern Argentine.] Primera Mitad. pp. 1–466. With numerous illustrations. Segunda Mitad. pp. 467–1064. With numerous illustrations. 1936. Buenos Aires. Imprenta de la Universidad.

These proceedings, collected in two volumes and together comprising over a thousand pages, are profitable for reference and are a welcome addition to libraries whose readers are interested in diseases of the tropics. For those who wish to keep up to date, however, these volumes are issued too late. The second volume, containing 85 of the 105 papers recorded, has only just reached us (May 1936), although they were read at the Conference in October 1933. The first volume, except for an article on Argentine scorpions, was concerned entirely with mycology. The second is by far the more important; it contains 5 articles on medical and applied entomology, 82 on pathology and experimental medicine, 7 on leishmaniasis and dermatology and the rest on human and comparative parasitology. Fortunately, some of the papers have already appeared elsewhere and have been abstracted in this *Bulletin*, so that by the time the full report of the Proceedings is available much of the contents are already well known. *H. H. S.*

DODGE (Carroll William) [Ph.D., Mycologist, Missouri Botanical Garden, etc.]. **Medical Mycology. Fungous Diseases of Men and Other Mammals.**—900 pp. With 142 figs. 1936. London: Henry Kimpton, 263 High Holborn, W.C.1 & St. Louis: The C. V. Mosby Co., 3523–25 Pine Boulevard. [42*s.*; $10·00.]

In his preface the author states that he presents a complete survey of the literature in this field to the end of 1933, and gives " for the first time . . . a relatively complete and accurate bibliography of existing literature." If " pathogenic fungi " be substituted for " fungous diseases " in the title, this becomes a fairly accurate statement of the scope of the book, for the mycological aspect completely overshadows the medical.

The first chapter is a brief account of systematic mycology, on the lines developed in the well-known work of GÄUMANN and DODGE. Like the latter it is somewhat overburdened with the special terminology beloved of the systematist. Then follow four short chapters on Physiology of Fungi, Culture Media, Isolation of Microorganisms, and Microscopy, containing a useful account of the special technique of the medical mycologist. It is difficult to see the purpose of Chapter VI, which is almost entirely a reprint of the International Rules of Botanical Nomenclature, unless it is to justify the author's polemical outbursts.

The rest of the book deals with the several classes of fungi *seriatim*. The classification of many of the important groups of pathogens will not receive universal acceptance and is certainly open to criticism. From the great class of Fungi Imperfecti have been removed all the genera believed to be closely related to perfect fungi, *i.e.*, Ascomycetes. Thus Monilia and related genera form a family termed Eremascaceae Imperfectae, the dermatophytes become Gymnoascaceae Imperfectae, and Aspergillus, Penicillium and related genera are all put in the Aspergillaceae, leaving a comparatively small number of genera in the Fungi Imperfecti proper. Keys are given to the pathogenic species of all genera described, followed by cultural and microscopical data for each fungus, with usually a brief, often very brief, clinical account. The illustrations are all of the type found in books on pure mycology and a great many are of value only to the worker who is primarily concerned with generic relationships.

The bibliography is a noteworthy feature and occupies a large portion of the book, the references for the Endomycetales alone occupying 50 pages, but, in view of the completeness and accuracy of the medical references, it is difficult to understand the frequent omission of references for purely taxonomic works cited in the text.

The book will prove to be a valuable book of reference for the mycologist who specializes in the study of the pathogenic fungi. It will have less appeal for the medical man who specializes in mycoses, whilst for the field worker it is altogether too cumbersome and diffuse.

G. Smith.

SNOWMAN (J.) [M.D., M.R.C.P.Lond.]. **Manual of Emergencies. Medical, Surgical and Obstetric. Their Pathology, Diagnosis and Treatment.** Third Edition.—pp. ix+401. 1936. London: John Bale, Sons & Danielsson, Ltd., 83–91 Great Titchfield Street, Oxford Street, W.1. [10*s*.]

Exactly ten years have elapsed since the second edition of the Manual was reviewed in this *Bulletin*, 1926, Vol. 23, p. 329. Since then many sections have been rewritten, new sections have been added and more recent views on pathology, diagnosis and treatment have been embodied to produce a volume containing a great deal of valuable information. At first sight it might appear to be a pocket manual but its well printed pages contain roughly no less than half the number of words as TIDY's Synopsis of Medicine! The criticisms offered in the review of the second edition are true of the present edition. As was then remarked "what is gained by giving some account of the operation for exposure and repair of a wound of the heart while omitting a description of how to perform paracentesis of the tympanum?" Many of the subjects treated can hardly be called emergencies. Thus for example though sudden loss of consciousness may occur in general paralysis for which

as the author states " there is of course no direct treatment," in a paragraph immediately below some account, not very well done, is given of malarial therapy in that disease. It seems a pity that what is really a valuable book should not have been more carefully planned. Nothing is said concerning the treatment of renal and biliary colic, nor how to give relief to an acute lumbago—presumably these are not emergencies—yet we are told that " in discussing the pathology of these diseases [nephritis] modern writers have adopted the term nephron to describe the glomerulus with its associated vessels and renal tubule." Some idea of the scope of the book will be gained by looking at the " Contents."

Dangerous emergencies in disease of the respiratory system—haemorrhage, obstruction, etc. Heart—syncope, auricular fibrillation, angina, coronary thrombosis, etc. Nervous system—cerebral haemorrhage and thrombosis, meningitis, encephalitis, coma, concussion, fracture of the skull, etc. Convulsions. Gastro-intestinal-tract—haemorrhage, obstruction, acute peritonitis, etc. Urinary organs—haemorrhage, retention, suppression. Poisons. Emergencies in midwifery. *H. S. Stannus.*

OGILVIE (W. H.) [M.D., M.Ch., F.R.C.S.]. **Treatment of Fractures in General Practice.** 2nd Edition. Vol. 1. pp. viii+1–108. With 27 figs. Vol. 2. pp. vi+109–180. With figs. 28–37. Pocket Monographs on Practical Medicine. F'cap. 8vo. 1936. London: John Bale, Sons & Danielsson, Ltd., 83–91, Great Titchfield Street, W.1. [2*s.* 6*d.* each volume.]

The issue of this most useful set of publications continues and the popularity of the work on Fractures is evidenced by the necessity for another edition. The subject of fractures and their treatment is one which comes within the purview of every man in general practice, and among those working in tropical countries with growing and developing industries accidents may constitute a no inconsiderable part of their duties and the prompt and correct treatment of fractures is all important. There is no need to speak in detail of the advantages of these Pocket-Monographs ; suffice it to say we are here presented in the handiest possible form with the method of choice of treating practically any form of fracture which the practitioner is likely to encounter. In the first volume the author devotes half of the 108 pages to general principles, and the rest to fractures of the upper limb and shoulder girdle ; in the second he deals with the lower limb and pelvis, and the thorax and spine, all in 72 pages—a model of succinct writing. The only omissions are fractures of the head—skull and face-bones—and the jaws. It is a little surprising that fractures of the nasal bones and mandible are not dealt with, for early correct treatment of the last is an essential to obtaining good results. *H. H. S.*

Printed under the authority of HIS MAJESTY'S STATIONERY OFFICE
by the South Essex Recorders, Ltd., High Road, Ilford.

(890) Wt. P2/166 1875 7/36 S.E.R. Ltd. Gp. 353.